The study of the relationship of coaching to the observed classroom teaching behavior of secondary school teacher-coaches.

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LA THÈSE A ÉTÉ MICROFILMÉE TELLE QUE NOUS L’AVONS REÇUE
A STUDY OF THE RELATIONSHIP OF COACHING
TO THE OBSERVED CLASSROOM TEACHING
BEHAVIOR OF SECONDARY SCHOOL
TEACHER/COACHES

by

William Eric McKnight

A Thesis
submitted to the Faculty of Graduate Studies
through the Faculty of
Human Kinetics in Partial Fulfillment
of the requirements for the Degree
of Master of Human Kinetics at
The University of Windsor

Windsor, Ontario, Canada
1977
A STUDY OF THE RELATIONSHIP OF COACHING TO THE OBSERVED CLASSROOM TEACHING BEHAVIOR OF SECONDARY SCHOOL TEACHER/COACHES

by

William Eric McKnight

This study examined the relationship between coaching and classroom teaching behavior. Forty-five Essex County Secondary School teacher/coaches were studied, including twenty-nine track and field, and sixteen non-coaching teacher/coaches. Following a modified Campbell and Stanley Separate-Sample Pretest-Posttest Control Group design, the classroom teaching behavior of the teacher/coaches and non-coaching teacher/coaches was observed before, during, and after the track and field season. Observations were recorded on the Intern Evaluation Checklist. Coaching was quantified in terms of the hours per week spent on coaching related activities. On the basis of an extensive review of research and development literature on teaching, leadership, and the measurement and/or evaluation of effectiveness in each role, additional information with respect to attributes of the teacher/coach, teaching, leadership, and specifics of the leadership situations in which participants were
observed was collected. Fiedler's 'contingency' model served to quantify the leadership variables. Data was subsequently analyzed by a variety of procedures including analysis of variance and covariance, multiple regression, causal analysis, and chi square.

Teacher/coaches and non-coaching teacher/coaches were found to spend comparable amounts of time on teaching related activities both during and outside of the track and field season. These groups were also found to be equivalent in terms of their teaching behavior for pre-season and post-season observations, but not for observations performed during the track and field season. The teacher/coaches during their coaching season proved to be significantly less proficient in their teaching behavior, and coincidentally less experienced in the teaching role and more task-oriented in their leadership style than the non-coaching teacher/coaches. The difference in teaching behavior was hypothesized to be the result of the differences in teaching experience and/or leadership style. In examining these possibilities, multiple regression analysis revealed a significant, direct, and positive relationship between teaching behavior and teaching experience. Teaching behavior and leadership style were not significantly related. Analysis of covariance was used to control for experience, and the significance of the difference in teaching behavior between teacher/coaches and non-coaching teacher/coaches was maintained. A counterproductive
coaching effect was therefore suspected.

Data obtained for track and field teacher/coaches observed during their coaching season was subjected to an in-depth analysis in order to establish a measure of verification for the suspicion of a coaching effect. With multiple regression analysis, a significant, direct, and negative relationship between the hours spent on coaching activities and classroom teaching behavior was revealed. A counterproductive coaching effect was therefore concluded.

Evidence in a causal analysis of the track and field teacher/coaches suggested that this coaching effect was somewhat offset by other variables in the teaching-learning environment such as coaching experience. In addition, it was concluded that coaching did not infringe upon the teacher/coach's time commitment to teaching related activities.

Most notable among recommendations for future research in education as well as the teaching/coaching interface were comparisons of teacher/coaches and non-coaching teachers, male and female teacher/coaches, and comparisons among a variety of other interschool sports and cocurricular activities. Included in recommendations to the Ontario Ministry of Education was an improvement in measures in teaching preparation programs to enable prospective teachers to manage the dual role responsibility of teacher/coach, and consideration of adjusting the teacher/coach's teaching and/or coaching workload.
DEDICATION

To my parents, whose love and unfailing encouragement helped make this personal goal possible.
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CHAPTER I

IDENTIFICATION - PROBLEM AND NEED

The association between the Ontario Ministry of Education and the Ontario Federation of School Athletic Associations (OFSAA), which coordinates regional school sports associations, began in the 1950's. Toward the latter stages of the following decade, the Ministry had become aware of a trend toward increasing competition in interschool sports, and of the pressures which accompanied it, particularly those with respect to finances, facilities, and teacher workloads (75). At this same time, on a regional level, a similar consciousness was developing in the Southwestern Ontario Secondary School Association (SWOSSA). In 1972 motions recommending that (1) SWOSSA and the University of Windsor's Sport Institute for Research (SIR) jointly investigate the role and status of school sports in SWOSSA, and (2) that attempts be made to encourage the Ministry of Education to endorse and fund such a study were adopted by SWOSSA (166), and by the OFSAA legislative council in the same year.

The Ministry responded in 1975 by requesting selected universities to engage in research which would
determine the present status of interschool sports in Ontario. This appeal was inspired by a genuine concern for the present condition of school sports after some thirty years of transition and exposure to surging pressure (75). Research grants were awarded to the University of Windsor and SIR to conduct an in-depth investigation of SWOSSA, and to Queen’s University to provide an approximation of the provincial picture. SIR’s fundamental tenet is that problems within educational/socializing sport are not the result of technical inadequacies, but rather accrue when professional/athletic excellence values are confused with, or replace those of educational/socializing sports (167:75). The ends, structures, and methods of professional athletics are not suited to, and may indeed have a detrimental effect upon socializing sports (119:24).

With increased competition in interschool sports, a suspicion arose that one consequence could be additional strain upon the teacher’s workload. In response to local and regional concern, the Ministry’s research contract with the universities included a question regarding the relationship between coaching and classroom teaching effectiveness. The contribution of interschool sports programs to educational objectives, and a variety of desirable qualities obtained through participation in them have often been proclaimed (95, 129,
140, 154, 160). At the same time, there has been some concern for the effect of the coach, as a role model, on players and students, as well as for the effect of participation in these programs on student achievement (95, 118, 162). Although these effects are often assumed to be detrimental (52:75), this may not necessarily be the case (168:172). In fact, students active as players in interschool sports programs have been found to have attained higher academic standings than non-active students in many cases (52, 54, 84, 154). By substituting the teacher for the student in this discussion, a similar and seemingly obvious question is exposed; namely, what effect, if any, does the participation of teachers in interschool sports programs, in a coaching capacity, have upon their effectiveness as teachers in the classroom? Whereas considerable concern for the welfare of students has been expressed, the same is not true for the teacher. Little actually seems to be known about the effect of coaching demands on teaching effectiveness.

In addressing this question, track and field teacher/coaches were observed while teaching in classrooms on critical occasions in relation to the track and field season: (1) pre-season; (2) in-season; and (3) post-season. For the purpose of comparison to augment the detection of significant variability in teaching behavior throughout the track and field season,
a control group composed of comparatively similar individuals, non-coaching teacher/coaches in a variety of other school sports, was observed at the same critical times. Observations were recorded on a relatively objective observation checklist developed by Powell (133) which locates a teacher's position on a teacher-centered versus student-centered continuum. As an effort to account, post factum, for the variability and complexity of the teaching, and leadership, environment, Fiedler's 'contingency' model (59) which hypothesizes relationships between leadership and situational variables, specifically, leader-member relations, the nature of group tasks, and the leader's power, was applied. Time demands for teaching and coaching were quantified in terms of the hours per week spent in these activities proximate to when observations took place. In lieu of their potential confounding effects on teaching behavior, several additional attribute and situational variables were recorded.

Format

So as to provide a systematic presentation of the contents of this thesis, a format utilized by the Sports Institute for Research has been followed (120: part II:8-23). Referred to as IDEA, the elements of the model are explained as follows: (1) Identification, the perception of a problem and the need for its
resolution; (2) Delineation, the disclosure of past and present research and development related to the problem; (3) Experimentation, the research methodology employed to solve the problem; and (4) Action, the resulting conclusions and recommendations.

The purpose of this chapter has been to provide the historical development of, to summarize the current status of, and to Identify the need to investigate the relationship of coaching demands to classroom teaching behavior. Next, in the second chapter, a Delineation of the major roles, viz., the leader, teacher, and coach, is imparted, as well as a review of research on teacher and leadership effectiveness and other pertinent topics deemed essential to a thorough appreciation of the complexity of teaching, the teaching environment, and the limitations affecting measurements of both. With this background provided, the formal statement of the problem, including associated subproblems, follows. The fundamental terms in these statements are then defined. Chapter III, in addition to explaining which and what kinds of variables were measured, identifies the population and sample, and then specifies the Experimental design, assumptions, evaluation instruments, methodology, hypotheses, and data analysis procedures. The ensuing results are communicated in the fourth chapter, along with an interpretation and discussion
of their merits. Finally, in the last chapter, the conclusions and recommendations for future Action/research are forwarded.
CHAPTER II

DELINEATION - RESEARCH AND DEVELOPMENT

In order that the problem as it has been advanced to this point may be understood more fully, an account of each major role implicated in the Identification phase, namely, the leader, teacher, and coach, is given in this chapter. A discussion of what teaching entails and factors which ordinarily influence it is of particular importance. The remark has been made that "research in teaching behavior fits into the broader area of research in leader behavior" (163:22). Thus, as both teaching and coaching appear to be distinct instances of leadership, a review of leadership theory, as well as variables and predominant elements common to teaching, coaching, and leadership may afford a meaningful contribution to the development and understanding of the problem.

In the second portion of chapter two, literature concerning teaching and leadership effectiveness, with specific references to the sport setting, is reported. With this background established, a formal statement of the problem, and a number of associated subproblems, follows. In closing, major terms in these statements are defined.
Leadership

Utilizing communication and interaction (14, 41, 94, 172), leaders endeavor to influence people (83, 94, 157, 174), or in other words, to modify their behavior (14, 31, 33). Leadership, however, involves more than a single dimension (31, 173, 174). Four leadership dimensions are generally acknowledged: (1) the organization; (2) the group; (3) the leader, and (4) the environment or situation (33, 59, 104, 172, 174). An organization is

... a system of relationships, formally prescribed and uniformly developed, that govern the activities of people who are dependent upon each other for the accomplishment of common goals or the satisfaction of common needs" (33:83).

Group members and leaders alike are responsible for accomplishing organizationally established goals and tasks (33, 41, 172). Authority is a factor enhancing the ability of the leader to influence members toward attaining these objectives. Two basic sources normally contribute to authority: (1) the formal status position of 'leader', and/or (2) informal sources such as the leader's personality, personal expertise, and the quality of relations between the leader and followers (15, 33, 41, 94, 172). These latter sources also serve partially to legitimize position power (33, 59, 172, 174).

The group exerts considerable pressure on its
members to conform to group standards, a pressure often more influential than that exuded by the organization (10:33-34). These standards serve as a basis for perceiving and interpreting the behavior of non-group members (10:32-35). In this respect, the willingness with which the group welcomes leadership attempts is a function of the similarity it perceives between the leader's personality and its own syntality (83, 94, 172). Furthermore, this acceptance reflects the extent to which group members believe that the leader can assist them to accomplish their tasks (172:169), thus satisfying the needs which originally brought them to the group (14, 70).

A single set of discriminating traits attributable to all leaders, which advantage them for the leadership role, is unlikely (104:18). Leader behavior is largely regulated by personal needs, perceptions, expectations, and capacities (14, 41, 57). Moreover, the character of the leadership situation is a critical factor influencing the nature and success of leader behavior (16, 33, 41, 59, 83). Tasks, as elements of the situation (33:21), are the activities, assigned duties, and expected behavior patterns in which people engage as a function of membership in an organization (33:63), and as such, affect leader behavior (31, 172) and the disposition of group members as well (33:64).
Leaders interact and communicate with group members in relatively consistent ways (59:36). These leadership styles can be conveniently illustrated with a continuum such as that developed by Likert in his work with management systems (97:222-35). At one end of the continuum the highest management levels monopolize goal establishment, decision-making, communication, and control functions for the purpose of ensuring conformity to prescribed roles (33:131). Group members are extrinsically motivated and susceptible to the fear of sanctions. The resulting atmosphere is one of apprehension, of distrust, with minimal cooperation among followers, and between followers and management. This style has been referred to as task-centered or autocratic. As leadership departs from this style, intrinsic motivation emerges and reward eventually supplants punishment. Communication networks expand, group members are permitted greater freedom to perform their roles. The atmosphere becomes more relaxed, members more trusting. At the opposite end of the continuum the leadership style is relationship-oriented or democratic. Followers share in the responsibility of decision-making, establishing objectives, and maintaining performance standards. Communication flows freely in both vertical and horizontal networks. Group membership and active participation furnish motivation, while cooperation and trust
predominate. However, the effectiveness of either the task- or relationship-oriented leadership style is dependent upon situational influences, particularly the nature of the group task (33, 59, 83, 174), the authority inherent in the leader's position (42, 59, 77, 141), and the quality of leader-follower relations (44, 59, 77, 141, 174). In all likelihood, theirs is a combined effect (174:31).

Teaching

The primary responsibility of teachers is the education of their students (25, 78, 102). Teaching, then, is deliberate action (23, 85, 179), interaction and communication, with the purpose of cultivating student learning (85, 157, 170). Each classroom is a unique social system (23, 24) wherein the teacher and students mutually influence each other's behavior (36, 57, 78, 157). Variability in the role performance of teachers may be accredited to the teacher, students, and the situation (78, 120, 137).

The unique background, personality, and needs of teachers partially influence their teaching behavior (78:146). A teacher's perception of, and actual behavior in, the school are related (34:60). Carlton has fabricated the following conceptual models to explain this relationship: (1) schools sustain the socializing role of the family, where the teacher is analogous to the parent; (2) schools produce useful, obedient citizens, where the teacher is similar to a civil servant; (3)
schools produce specialists on a supply and demand basis, where the teacher is more of a technical instructor; (4) schools transmit, not unlike a religious institution, a system of beliefs and conduct, where the teacher corresponds to a religious figure; (5) schools guide students toward the expertise and skill needed to continue the process, which teachers assume to monopolize; (6) schools restrain students as would a correctional or mental institution, until they are considered capable of self-direction, where the teacher is comparable to a therapeutic counselor; and lastly, (7) schools provide students with the opportunity for self-direction and interaction, where the teacher assumes a facilitating role. The authenticity of the models as they interpret the classroom behavior of individual teachers has been verified (136). These models also serve well to illustrate three basic sub-roles: (1) instructor; (2) facilitator; and (3) disciplinarian.

Given the responsibility of promoting student learning, teachers structure their classroom environments to ensure that students perform roles which are conducive to learning (70, 78, 102, 126). In structuring the classroom, interaction and communication may transpire in a variety of forms. The various ways, or teaching styles, in which teachers interact and communicate with students, alluded to somewhat in Carlton's models, and clearly
outlined by Mosston (122), are distinguished on the basis of the focus of attention, viz., on the teacher and learning content or on the student and learning process, as well as the manner in which communication is managed. In reference to the teacher/content-centered teaching style, the majority of the decisions concerning learning content, objectives, methods, and pace are administered by the teacher (34, 122, 170). Communication is normally directed from the teacher to the student, thereby isolating students and restricting their access to information (135:10). Control is autocratic, guided by rigid behavior standards (122:33). During the transition from a teacher- to a student-centered focus students become more active in the interaction/communication process. Decision-making responsibility is gradually relinquished to students, initially, with respect to the learning pace, and eventually, to the content and objectives of learning experiences. The emphasis shifts from behavior prescribed by the teacher to original behavior on the part of the student. With the student/process-centered style, students individually choose the direction, objectives, methods, and pace of their explorations. As a teaching style becomes more student/process-centered, the teacher would appear to become less of an instructor, actively directing students, and more of a facilitator, passively guiding students.

The student/process-centered teaching style is
customarily afforded a more favorable appraisal than its counterpart (14, 70, 157, 187). This inequity may reflect a stigma associated with the concept of autocracy in North American society since neither teaching style has, in actuality, been proven more effective in most situations (8, 29, 39). In reference to Carlton's models, Powell and Cottrell state that "no one model [style] is superior to another except as the situation demands it" (136:8). Brophy and Evertson indicate that the appropriateness of either process- or content-centered teaching is substantially determined by the age and intellectual development of the students (29:140).

Student enactment of roles which are conducive to learning is ensured by the establishment of rules and procedures, by teachers, which promote order and discipline (70, 78, 102). The power and authority necessary to effect order is derived, in part, from the legal and traditional authority associated with the teacher's role (78, 102, 157). Additional factors enhancing or legitimizing this formal source include personal expertise in the subject area, adult status, and the quality of teacher-student relations (78, 157). Order and discipline should be further augmented if communication is handled in such a way that students are isolated from one another (135:10).

At the outset of this section the assertion was made that student behavior influences that of the teacher.
There are many student subcultures within the school (23, 102) which regulate student attitudes toward academic achievement (23, 25, 36, 102, 157). If the student majority does not value it highly, achievement is of little value in maintaining peer group status. Therefore, an impetus endorsing achievement will be lacking. The opposite is likely to be true when there is high student regard for academic achievement. This situation transpires fundamentally because people wish to be accepted and respected by their peers (23:31). Pupils' resulting participation in the classroom subsequently affects teacher preference for teaching style (57:706). Emmer, Oakland, and Peck further report evidence that negative student behavior produces increased negative teacher behavior (57:701). However, no substantive theory has been advanced which successfully explains or forecasts productive teacher-student relations (23:8).

Coaching

Coaches perform an assortment of roles including those of teacher and leader (40, 65, 67, 161, 177). Gaylord suggests that "coaching is the art and science of teaching through sports" (67:2). The coach's behavior is, in part, governed by his/her character (40, 67, 176). Uncertainty prevails as to whether or not coaches are unique, that there is something exclusive about them which is not true of those who do not coach (40, 161).
Some influential factors in addition to the coach's character include the authority inherent in the coach's role and the coach's expertise in the sport (40, 161). Furthermore, the nature of the coaching situation (40, 57), such as professional athletics vis-à-vis amateur sports, will have an impact upon coaching behavior. The coach may ultimately contribute to the personal development and achievement of individual players (161:351).

**Similarities**

The roles of leader, teacher, and coach not only appear to be interrelated, indeed, the teacher and the coach each seemingly exemplify leadership (see Figure 1). In each instance the role actor's intention is to influence others, through interaction and communication, toward a goal. Behavior in this regard is primarily affected by four factors: (1) the personal constitution and abilities of the actor; (2) organizationally granted power inherent within the role; (3) the quality of the relationships between the actor and group members; and (4) the nature of the situation confronting the actor. The ensuing behavior of the teacher, coach, and the leader can be identified as more or less task- versus relationship-oriented.

**Teacher Effectiveness**

Teacher effectiveness research "is concerned with the relationships between the characteristics of teachers,
Fig. 1. The leadership, teaching, and coaching environment.
teaching acts, and their effect on the educational outcomes of classroom teaching" (62:24). Little success has been realized in defining teacher effectiveness, discovering its prerequisites, or in identifying distinguishing characteristics of effective teachers (12, 58, 115, 117, 151, 169). This predicament perhaps reflects the complexity of teaching and teacher effectiveness (14, 25, 78), particularly the dynamic interaction of pupils, the purposes and objectives of individual educational programs, unique value systems, and the characteristics of the teaching-learning environment (12, 62, 148, 171). Under such circumstances there is provision for the possibility of many 'effective' teaching styles (62, 148). Thus far, the results generated from teacher effectiveness research have not proven to be decisive (7, 71, 85, 169) or especially relevant (62, 151).

Role Theory

The position of teacher seems to be an aspect of role differentiation. No uniformly accepted definition of 'role' endures (78:71), but a role here is considered to be a set of expectations (20, 31, 41, 88, 172) regarding the rights and required or probable duties of an individual in a specific position (20, 36, 41, 165, 172, 177, 178). When two roles are associated, the occupant of each contributes to the definition of the other. Thus, actual role behavior, where there are many affiliated roles, is
most likely affected by a variety of divergent expectations (78:95) which will not necessarily coincide (20, 78, 165, 178). Some expectations are more influential than others, and this detail, in conjunction with such factors as the teacher and the situation, suggest that it is unlikely that all expectations will [or could] be satisfied. The result of unsatisfied expectations may be conflict (41, 78). Conflict may fail to materialize if the discrepancy remains unnoticed, or can develop when differences which, in reality, do not exist are perceived (78:83).

One origin of role conflict is the simultaneous presentation of two incompatible roles. Other examples include instances when role partners hold different expectations, where those of one partner conflict with the personal convictions of the other, and where the exact role requirements are ambiguous (41, 78, 174).

The identification of an effective teacher can be expected to be highly relative (12, 90, 96, 165) when the teacher's role is comprised of numerous expectations, influenced by school and community conditions, conventionally focused upon some index of learning achievement, which belong to the teacher, other teachers, and those people with whom they interact (68, 69, 165, 178). A consensus of expectations, as explained, is unlikely. The implications for research are that
... when a supervisor or principal or observer is asked to identify for the researcher the good teacher, we are likely to have among our group of 'goodness' as many different kinds of people as we have frames of reference of identifiers (96:100).

This problem could partly account for the absence of useful and acceptable definitions in this area of research (12, 113, 155).

**Teacher Effectiveness Criteria**

A corresponding difficulty in defining valid and uniform criteria of teacher effectiveness has been experienced (27, 115, 127). References are most often made to two classes of criteria: (1) teacher assets and behavior assumed to be related to effectiveness, and (2) student growth and achievement (13, 149, 155, 159). There is substantial agreement that the latter be considered the 'ultimate' criterion (62, 117, 146, 151, 158), but that technique chosen recurrently, rating, focuses on the former or 'proximate' class (58:56).

**Teacher Qualities and Behavior**

Concentrating on behavior, observation oriented research techniques seem to display encouraging promise for teacher effectiveness research (1, 12, 29, 85, 100). Their basic supposition is that observable teacher behavior has an effect on student behavior (115, 130, 185) while the certainty of this assertion is doubtful (7, 62, 114, 153). Distinct, systematically and objectively observable patterns in teacher-pupil interaction are
claimed (6, 21). Those which are selected for study typically reflect the investigator's philosophy of teaching and/or the objectives of the inquiry (5, 21, 85, 127). Waetjen recommends that "one cannot evaluate teaching simply by going into a classroom without any scheme or schedule or checklist in hand and just watching what goes on" (181:18).

The degree of inference required to perform observations appears to be a significant concept (17, 21, 175). An observation technique is considered to be structured when those behaviors to be observed are defined, while those featured in unstructured techniques are not. More inference, or subjective judgement on behalf of the observer, would be expected in the unstructured situation. Rating scales are classified as high inference measures because they lack references to explicitly defined behaviors (144:81). The use of student ratings for assessing teacher effectiveness has customarily been justified with arguments that students are able to distinguish between a teacher's behavior and personality, and that they observe teachers everyday (27, 79, 87, 128). However, their practicality is disputed on the grounds that the ratings are based as much on personality as on teaching skill (27, 79, 87). Attempts to validate student ratings, and ratings in general, with student academic achievement have been inconclusive (48, 114, 121). Furthermore, the
effect of grades on these ratings is pending, while teaching experience displays a curvilinear relationship to them (38, 62, 180). Peer, supervisory, and self-ratings have not met with better success (31, 82, 132). Rating techniques have been especially criticized for doubtful validity and reliability (21, 47, 144, 171, 175).

In structured observation situations, observers watch for and record only specific behaviors under relatively objective conditions (112:163-64). Category systems seem to be the most popular structured observation format. Assuming that "affective and instrumental aspects of behavior can be coded and observed independently" (26:534), an observer first recognizes, and then records in appropriate categories, verbal and, frequently, non-verbal behaviors (21:212). These systems are designated as low inference measures "because the items focus upon specific, denotable, relatively objective behaviors" (144:281). Without explicit definitions, interobserver differences become plausible sources of inconsistent or inaccurate data (165, 185).

Observation measurements are usually based on either time or frequencies. In one form of time measurement, the variety of behaviors occurring in a given period of time (e.g. 10 seconds) are recorded, in which case similar samples of behavior are periodically taken throughout the
observation period (26:541-42). An alternate form of time measurement reflects the duration of particular behaviors from their onset to conclusion (4:669). The measurement of behavior by frequency tabulations typically incorporates a cumulative recording of the incidence of defined behaviors or sets of behaviors. Neither measurement system will necessarily register the importance of a behavior: a single incident may have immense significance (4:673). In either case it is essential that an observer be exposed to a teacher long enough to secure a representative sample of behavior (140, 171, 189). The comment has been made that "a single half hour observation is nearly worthless for most research purposes" (56:238).

Low reliability with observational research can be traced to three basic sources: (1) the subject; (2) the instrument; and (3) the observer (103, 120). Subject variability accounts for most of the variation in scores (30, 103). Category systems have been criticized for questionable reliability of the individual categories, inadequate rationale for placing behaviors in any one particular category, and for the tentative nature of assumptions concerning the exhaustiveness of the categories (21, 55). Procedures for selecting and training observers, together with their peculiar attributes, are critical (26, 30, 182) in that "data are as precise, accurate, and valid as the observer who collects them"
Almost certainly, different observers will disagree as to the exact classification of the same observed behavior (103, 182). Adopting interobserver agreement as an index of reliability is disputable in that if the categories are not individually reliable, interobserver agreement may be of limited value and could create unwarranted confidence in the accuracy and objectivity of the instrument (30:6). Estimates of observer bias are precluded where only one has been utilized (103:14). The observer's presence in a classroom may modify the behavior of the observed teacher (26, 51, 78, 106, 116). Many observation-oriented studies have assumed that observer reactivity was negligible or that it diminished over time, whereas it is not yet known when, or if, an observer's presence in the classroom is forgotten (106, 116). On the other hand, category systems have been praised for improved reliability over other methods (103:15). Assertions of validity have generally been based on the strength of reliability (116:512), evidently a questionable practice.

These kinds of problems effectively illustrate the rudimentary development of observational research (63, 85, 124). As yet, there is no basic model or terminology to proceed from, no consensus regarding concepts such as educational goals, teacher effectiveness, or pertinent behavioral variables (5, 55, 124, 144). Neujar refers to this as preparadigmic research (124:225). Nonetheless,
another author believes that

... once an observation technique has been developed
to measure a dimension it will be found to be more
objective and accurate than any rating scale, and
just about as valid and more quickly used than any
other instrument developed for analyzing behavior
(112:164).

As an alternate research strategy which also focuses
on teacher behavior and/or qualities, personality assess-
ment techniques have been used with the intention of
identifying teacher qualities considered to be conducive
to teaching effectiveness. Although the teacher's person-
ality is a prominent factor in the teaching-learning pro-
cess (47, 73, 147), and although sound psychological
health is thought to be beneficial to effective teaching
(43, 86), the application of an assortment of personality
instruments to teacher effectiveness research has yielded
inconsistent and inconclusive results (22, 27, 28, 62, 86).
The time may well be for researchers

... to abandon not only the fallacious notion that
anyone can recognize an effective teacher by watching
him teach, but also a second, and subtler, fallacy
which underlies it. It is time to question the widely
believed but almost certainly incorrect idea that
there exists a single set of performance competencies
of skills and abilities - which all or nearly all
effective teachers have, and which all or nearly all
ineffective ones lack (115:43).

Student Academic Achievement

Employing student academic achievement as a criterion
of teacher effectiveness is contestable because of the
problem of isolating a particular student's achievement
as being the result of a particular teacher's influence
(1, 13, 36, 78, 121). In all probability, academic achievement will be affected by demands outside of the classroom, students' current and previous teachers, self-learning, differences in course content, and family pressures acting upon students and teachers alike (2, 12, 121, 143, 151). Actual student learning may be misrepresented where students value different goals for a course than those established by the teacher (12, 101, 121, 143, 155). Standard achievement tests may be insufficiently diagnostic to accommodate specific learner behaviors (13, 180). Such tests have been censured for a narrow view of teacher effectiveness and for underestimating the full complexity of pupil growth and the teacher's role (1, 13, 121). Overall, success in evaluating teacher effectiveness with indices of student achievement has been inconsistent (101, 113, 145, 180).

**Leadership Effectiveness**

Solomon, Bezdek, and Rosenberg have stated that "research in teaching behavior fits into the broader area of research in leader behavior" (163, 22), a contention which is acknowledged elsewhere (48, 133, 163). Corresponding to the status of teacher effectiveness research, a concise and generally accepted definition of leadership has proven to be elusive (31, 172). Another parallelism, noted earlier in the chapter, is exemplified in that the effectiveness of either the task- or relationship-oriented
leadership style is contingent upon such situational variables as the quality of leader-member relations, the nature of the group task, and the power inherent in the leader's position. Neither leadership style is consistently related to productivity (172:370).

The Contingency Model

Much of the more noteworthy research on leadership effectiveness is based on the work of Fred E. Fiedler. Fiedler's observations of leadership led to his 'contingency' model which "postulates that the performance of interacting groups is contingent upon the interaction of leadership style and situational favorableness" (60:128).

Leadership style was found to be a manifestation of the leader's basic need foundation and, depending upon the leader's experience in a given role (59:43), is relatively consistent over time, whereas actual behavior varies from situation to situation (59:36). Fiedler ultimately devised an instrument, the Least Preferred Coworker (LPC), which measures a leader's underlying need structure, thus identifying leadership style as well. These styles are polarized as (1) a task or autocratic orientation (low-LPC score), and (2) a relationship or democratic orientation (high-LPC score).

The relationship-oriented leader finds personal esteem and ego satisfaction within the job through auspicious interpersonal relations with the group, while the
task-oriented leader derives such satisfaction through successful task performance, purposefully seeking favorable relations only when considered essential to provoking such success (59:45-46). An intermediate LPC score denotes a leader and leadership style distinct from the others. This leader is less authoritarian or socially concerned, and more task-oriented and critical than either counterpart (59:51). The 'contingency' model hypothesizes that in situations which are either highly favorable or unfavorable for effective leadership, a task-oriented style is more appropriate than a relationship-oriented style. The latter orientation is best suited to intermediately favorable situations (59:147).

The situation, in this model, is comprised of leader-member relations, group task structure, and leader position power. Leader-member relations are largely a function of the leader's personality (59:29). Group acceptance and loyalty will supplant a dependence upon organizationally bestowed power to augment the leader's influence (59:31). The group exists to perform certain tasks (59:26). The more structured these tasks are, the more that group behavior is predetermined in that procedures are defined and easily verified. The less that this is the case, the less the task is considered to be structured. Structure is divisible into four dimensions: (1) the ability to verify the correctness of a solution; (2)
the certainty of group members as to the task requirements; (3) the number of alternative methods to reach a solution; and (4) the number of possible correct solutions (59:28). Fiedler indicates that, in the classroom, task structure depends upon the specific subject matter of the lesson (59:221). Contributing the least to situational favorableness, position power is the extent to which the actual position of leader enables the leader to convince the group members to accept and follow directions (59:222). In that this power is reinforced by a highly structured task, but abated by one which is unstructured (59:27), it will not necessarily simplify leader influence.

The character of the leadership situation has been classified into octants on the basis of the importance of the respective elements. Octant I is considered to be the most favorable, representing good leader-member relations, a highly structured task, and strong position power (see Table 1). At the opposite extreme, Octant VIII represents poor leader-member relations, a weakly structured task, and weak position power. In either case, the task-oriented leadership style is postulated as being best suited for effective group leadership. The model has been validated in interacting group situations where coordination is essential to efficient group functioning (50, 60, 82). Groups characteristic of classrooms are considered to be coacting; class members work in relative
TABLE 1,
CLASSIFICATION OF LEADERSHIP SITUATIONS

<table>
<thead>
<tr>
<th>Octant</th>
<th>Leader-member relations</th>
<th>Task Structure</th>
<th>Position Power</th>
</tr>
</thead>
<tbody>
<tr>
<td>I</td>
<td>Good</td>
<td>High</td>
<td>Strong</td>
</tr>
<tr>
<td>II</td>
<td>Good</td>
<td>High</td>
<td>Weak</td>
</tr>
<tr>
<td>III</td>
<td>Good</td>
<td>Weak</td>
<td>Strong</td>
</tr>
<tr>
<td>IV</td>
<td>Good</td>
<td>Weak</td>
<td>Weak</td>
</tr>
<tr>
<td>V</td>
<td>Moderately poor</td>
<td>High</td>
<td>Strong</td>
</tr>
<tr>
<td>VI</td>
<td>Moderately poor</td>
<td>High</td>
<td>Weak</td>
</tr>
<tr>
<td>VII</td>
<td>Moderately poor</td>
<td>Weak</td>
<td>Strong</td>
</tr>
<tr>
<td>VIII</td>
<td>Moderately poor</td>
<td>Weak</td>
<td>Weak</td>
</tr>
<tr>
<td>VIII-a</td>
<td>Very poor</td>
<td>High</td>
<td>Strong</td>
</tr>
</tbody>
</table>

independence of one another. Under such circumstances the model has only been moderately validated (37, 44), most recently by Reavis and Deriega (139).

Teacher Effectiveness and Sport

Documented teacher effectiveness research applied to physical education is uncommon, while that which is to be found generally reports the use of student and supervisory ratings together with measures of teacher personality and traits (35, 71, 89). Results have been as inconsistent as those unearthed in other areas. The instructional effectiveness of coaches (137), and of teachers concomitantly coaching, has been discussed (66, 99, 108). There is conjecture both that coaching does (49, 99) and does not (66:19) have a counterproductive effect upon teaching. Massengale's thesis is that dual role expectations confronting teacher/coaches leads to role conflict (108, 109). He proposes that alternatives available for managing this sort of problem are to conform to one's own expectations, those of one or the other or both adverse sources, or to change the situation precipitating the conflict. When the solution becomes a choice of one or the other role, the choice is usually in favor of coaching (108, 109). However, Massengale is referring to the problem as it is in the United States, where the term coach/teacher might be more appropriate in that coaching success is important for job retention (49, 107,
108), which is not likely as true in Canada (152:17). Massengale and Locke have subsequently found that the most perceived and experienced source of conflict is the combined workload of coaching and teaching (110:44).

With regard to the Sports Institute for Research investigation of the status of interschool sports in Ontario, focusing on Southwestern Ontario (76), responses to an opinionnaire reveal that, of the teacher/coaches sampled, only twenty-two percent felt that coaching responsibilities had a counterproductive effect on their teaching, thus partially contradicting Massengale’s findings. The substance of informal dialogue with Windsor teacher/coaches and physical education department heads offers support both for and against a counterproductive effect.

Statement of the Problem

Are coaching demands significantly related to, or a product of, the track and field teacher/coach’s classroom teaching behavior?

Subproblems

1. Does the classroom teaching behavior of teacher/coaches, concōmitantly engaged in coaching activities, differ from that of non-coaching teacher/coaches?

2. Does the classroom teaching behavior of teacher/coaches differ while coaching as compared to when not coaching?
3. Does the favorableness of the leadership situation differ between teacher coaches and non-coaching teacher/coaches when the former is (a) coaching and (b) not coaching?

4. Does the favorableness of the leadership situation for teacher/coaches differ while coaching than when not coaching?

5. Is there a significant relationship between situational favorableness and classroom teaching behavior of teacher/coaches when (a) coaching and (b) not coaching?

6. Is the time required by teaching related activities significantly related to the classroom teaching behavior of teachers in this study?

7. Is there a difference in the time required by teaching related activities of teacher/coaches than for non-coaching teacher/coaches?

8. Is there a difference in the time required by teaching related activities for teacher/coaches when coaching than when not coaching?

9. Is the time required by coaching activities significantly related to the classroom teaching behavior of teacher/coaches?

**Definition of Terms**

1. Classroom teaching behavior is defined as observable communication management skills displayed by the teacher.
2. A teacher/coach is an individual who, in addition to the teacher's role, concurrently assumes the responsibilities of an interschool track and field coach.

3. A non-coaching teacher/coach is an individual who acted as an interschool sports coach, in any sport, prior to, but not during, the interschool track and field season.

4. Situational favorableness is the extent to which the character of the teaching leadership situation, as measured by the elements of the 'contingency model', reinforces the teacher's attempts to influence students.

5. Leader-member relations are "the degree to which the leader feels accepted by the group and relaxed and at ease in his role" (59:32).

6. Task structure is the "extent to which the leader is able to control and supervise his group members by virtue of the fact that the task is structured or capable of being programmed" (59:28).

7. Position power is "the degree to which the position itself enables the leader to get his group members to comply with and accept his direction and leadership" (59:23).

8. Leadership style is defined as "the underlying need-structure of the individual which motivates his behavior in various leadership situations" (59:36).

9. A relationship-oriented leader is "a person who derives his major satisfaction from successful interpersonal relationships ..." (59:45).
10. A *task-oriented leader* is a person who "derives his major satisfaction from task performance" (59:45).
CHAPTER III

EXPERIMENTATION - RESEARCH DESIGN
AND METHODOLOGY

Philosophical reasoning involves the careful evaluation of relevant arguments in light of their merits and demerits as they contribute to explain a philosophical and/or pragmatic issue. Equivalent to this strategy in this thesis was the discriminatory selection of variables, measurement instruments, and a research design which could most effectively lead to an enlightenment with respect to the relationship of coaching demands to classroom teaching behavior.

The study was conducted in the Essex County Secondary School Association (ECSSA), focusing on track and field teacher/coaches. Track and field teacher/coaches and non-coaching teacher/coaches were observed in their various classrooms before, during, and after the track and field season. The hypothesis was formulated that if coaching affected classroom teaching this effect could be detected by adopting such an observation schedule. This chapter itemizes the elements of the investigation, identifying variables which were measured, specifying the population and sample, and describing the
research design and data collection instruments. Following an outline of data collection, processing, and analytical procedures, and a presentation of the hypotheses which were tested, limitations imposed by the data, design, and methodology are acknowledged.

Variables

Profiting from insight into teaching behavior acquired from a review of literature and informal discussion with researchers and practitioners, a number of variables associated with attributes of the teacher, the observation setting, and leadership were chosen for study (see Table 2). The argument developed in chapter II, that observation techniques seem to exhibit fewer weaknesses while offering more diagnostic possibilities than other methods for measuring and analyzing teaching behavior, motivated the selection of observable classroom teaching behavior as the dependent variable (criterion). As it was possible to conduct pre-season, in-season, and post-season observations, observation arrangements therefore represented the independent variable. The variable (predictor) most fundamental to the research problem, coaching, was quantified in terms of the hours per week spent in coaching related activities. Remaining attribute and leadership variables were selected because of their potential confounding effects. These variables included the teacher's sex, experience
# TABLE 2

**CLASSIFICATION OF VARIABLES MEASURED IN THE STUDY**

<table>
<thead>
<tr>
<th>Teacher</th>
<th>Observation setting</th>
<th>Leadership</th>
</tr>
</thead>
<tbody>
<tr>
<td>Teaching behavior</td>
<td>Subject taught</td>
<td>Leadership style</td>
</tr>
<tr>
<td>Teaching experience</td>
<td>Grade level</td>
<td>Leader-member relations</td>
</tr>
<tr>
<td>Coaching experience</td>
<td></td>
<td>Task structure</td>
</tr>
<tr>
<td>Hours teaching</td>
<td></td>
<td>Position power</td>
</tr>
<tr>
<td>Hours coaching</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Teacher's sex</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
as a teacher and as a coach, the hours per week spent in teaching-related activities, as well as the observed subject area and grade level. In addition, the fundamental elements common to leadership, teaching, and coaching, which were identified in the second chapter, viz., leadership style, leader-member relations, task structure, and position power, were measured in an effort to account for situational variability and its impact on leader effectiveness.

Population and Sample

All 1975/76 Essex County Secondary School Association (ECSSA) interschool track and field teacher/coaches constituted the experimental population, while the control population consisted of all 1975/76 non-coaching teacher/coaches. Both populations were considered to be real, in that they actually existed, and finite, in that they were limited in number.

The experimental sample of twenty-nine participants, of which twenty-six were males and three were females, essentially exhausted the experimental population. The control sample included sixteen participants, eleven males and five females.

Research Design

An experimental group, consisting of two subgroups, and a single control group, were studied. Experimental
groups were those involved in coaching, the treatment effect. Experimental subgroup A included fifteen track and field teacher/coaches, while fourteen were included in subgroup B. The control group C consisted of the sixteen non-coaching teacher/coaches.

The research design was based upon Campbell and Stanley's Separate-Sample Pretest-Posttest Control Group Design (32:55), with modifications to allow for observations concurrent with the treatment (see Figure 2). Of the two experimental subgroups, subgroup A1 was observed once, prior to the initiation of the track and field season (pre-season), whereas group B was observed both during the season (B2), coincidental with the treatment (in-season), and again (B3) immediately following the end of the season (post-season). Control group C, from whom the treatment effect could be withheld (was absent), was subjected to three measurements (C1, C2, C3) on occasions paralleling those of groups A and B, thus providing a basis for comparison. A separate sample (A1) is included in the design on the rationale that, otherwise, a treatment effect at B2 might be true only for a pre-tested group (B1). The substitution of A1 for a B1 consequently strengthens the ability to generalize to the experimental population.

Instrumentation
Fig. 2. The research design providing for pre-, in-, and post-season observations.
Intern Evaluation Checklist

The Intern Evaluation Checklist (IEC) was designed for the purpose of diagnosing the progressive development of communication management skills exhibited by the teaching intern (133:1). The educational philosophy advocated by Powell, the originator of the IEC, is that...

... we should give the child the opportunity to explore his environment and himself with steadily increasing self-initiative in both the cognitive and affective domains. We need to add the enactive dimension wherever it is missing. We also need to increase the opportunity for cooperation and interaction (134:38).

The acquisition of certain coping skills which are vital to survival in a physical and social environment is considered as important as traditional information transmission (134:30). In order that such skills might be taught, students must be permitted to discover and create (134:52), and educators must be willing to relinquish more decision-making responsibilities to students. Classroom communication, traditionally dominated by the teacher, should accentuate student interaction. Similar philosophies are expressed both internationally, in UNESCO's International Commission on the Development of Education Today and Tomorrow, the Faure Report (179); and provincially, in the Report of the Ontario Provincial Committee on the Aims and Objectives of Education in the Schools of Ontario, the Hall-Dennis Report (126), as well as in the expositions of many eminent North
American educators.

The IEC assumes that, in order to accommodate both thinking and information level content, teachers must be adept in communication management skills. These teachers are further assumed to be process- and child-oriented (133:2). Only part II of the IEC, consisting of twenty-nine categorically defined communication management skills, was used (see Appendix A). Detailed descriptions of the categories may be found in Powell (133). Because some behaviors are more appropriate to some situations than others, at least two hours of observation for each intern is recommended (133:7). Individual categories are recorded on a frequency basis and scored on a qualitative basis, receiving an outstanding, satisfactory, or unsatisfactory score. Where a category has not been observed, an unsatisfactory score is awarded. Outstanding scores are assigned a plus (+), and unsatisfactory scores a minus (-), while satisfactory scores are treated as neutral (0). Pluses and minuses are totaled separately, and the latter total is then subtracted from that of the former to yield the overall score which ranges from -29, indicative of teacher/content-centered instruction, to +29, indicative of student/process-centered instruction.

Least Preferred Coworker

The Least Preferred Coworker (LPC) scale (see
Appendix B) measures a leader’s underlying need foundation, thus providing an index of leadership style. To complete the instrument, a leader is asked to describe a person from the past or in the present with whom s/he has been least able to work well. Descriptions are obtained with sixteen, eight-point bipolar adjective scales. Scores are derived by summing the items on the instrument (see 59:40-41). High LPC scores (65 and above) denote a relationship-oriented leader, intermediate LPC scores (37 to 64) indicate a leader distinct from the other two types, but about whom very little seems to be known; and low LPC (below 37) scores designate a task-oriented leader (59:43).

Group Atmosphere Scale
Leader-member relations can be appraised with a ten-item Group Atmosphere Scale (GAS), similar in construction to the LPC, which is completed by the leader (see Appendix C). These ratings express the extent to which the leader feels accepted by group members (59:32). A high GAS score (69 and above) indicates that the leader feels accepted by group members; an intermediate score (56 to 68), moderately accepted, and a low score (below 56), rejected (61).

Hunt's Task Structure Rating Form
Task structure is a composite of four dimensions:
(1) the ability to verify the correctness of a solution;
(2) the clarity of task requirements to group members;
(3) the variety of alternative means to reach a solution;
and (4) the number of possible correct solutions (59:28).
The Hunt Task Structure Rating form was utilized (see 59:282-91). Each dimension consists of eleven 'anchor jobs', e.g., from those exhibiting the least goal clarity, such as an idle millionaire, to those exhibiting the most, such as an axle assembler, and descriptions of each to be used for comparison purposes. The number associated with the anchor job most like the task being rated is the ranking for that task on that dimension. The sum of rankings for all dimensions provides an overall task structure score. Highly structured tasks (24 and above) are explicit and refined, whereas weakly structured tasks (below 24) are more ambiguous and open.

Position Power Checklist

Position power is the degree to which the leader's position itself helps the leader to convince group members to accept direction and leadership (59:22). A measure of position power is derived with an eighteen item checklist requiring a rater to rate certain statements as either true or false while considering the particular leadership position (see Appendix D). Only true statements are counted. A high score (12 and above) signifies strong position power; a low score (below 12), weak position power.
Miscellaneous Information Form

To secure the remaining attributive and observational data, a Miscellaneous Information Form (MIF) was devised (see Appendix E). Each participant's name, sex, and observation group were noted for filing purposes. Participants were asked to indicate essentials concerning the observed class, notably, the subject, grade level, and nature of the group task. Information concerning teaching and coaching experience, as well as the hours per week spent in teaching and coaching related activities was also requested.

Assumptions

Observable teaching behavior was assumed to be related to student learning and achievement.

The Research Program

The research program which was followed can be partitioned into six phases: (1) admission; (2) cooperation; (3) organization; (4) action; (5) data processing; and (6) communication.

Phase I - Admission

In the initial phase of the research program, the author and the study were introduced to ECSSA principals for the purpose of obtaining permission to proceed with its operation. Voluntary cooperation was considered an integral source of the good will essential to the success
of such a field study. During meetings with the principals of the high schools, the need for, and purpose of the study, as well as the research design and data collection procedures were outlined. Prospective track and field coaches and potential control group members were usually identified during these interviews.

Phase II - Cooperation

The cooperation of prospective experimental and control group participants was sought in this phase. Appointments with each individual were arranged, wherein the background and the character of the problem were discussed. The research design, instruments, and specific requirements of participants were explained. Each prospective participant was assured of anonymity. A candid presentation was considered indispensable for placing these individuals at ease with respect to a potentially threatening situation posed by an observer's presence in the classroom.

Phase III - Organization

Phase III involved the organization of group membership, and the designing of an observation schedule. The composition of experimental subgroups A and B was randomly determined, except in instances where subjects were already coaching an interschool sport. Although unable, then, to be included in group A, because track
and field was the final interschool sport of the year, the problem was reconciled by including these individuals in group B. Subjects in control group C were randomly selected from among those non-coaching teacher/coaches who had indicated a willingness to participate in the study.

The observation schedule was designed to accommodate the ECSSA and SWOSSA track and field meets as well as the end of the school year. The following observation schedule was adopted: (1) group A₁ was observed prior to group C₁ on pre-season observations; (2) group C₂ was observed prior to group B₂ on in-season observations, the latter during the week of the ECSSA track and field meet; and (3) group C₃ was observed prior to group B₃ on post-season observations, the latter during the week which fell between the SWOSSA and OFSAA track and field meets. One full week was allotted for the accomplishment of observations for each group.

Phase IV - Action

The completion of the observation schedule and collection of data was the objective of the action phase of the research program. Prior to actual observations, the author was trained in the use of the IEC over two consecutive days in an elementary school setting. Participants were afforded advanced warning through the school office of the day on which they were to be ob-
erved so that if an observation on that day was not feasible, arrangements for another time during the same week, which was amenable to both the participant and the author, could be made. The day on which teachers in a particular school were observed was determined randomly. Attempts were made to coordinate observations each day so that all participants to be observed on that day could be seen in succession.

Depending upon the length of classroom periods for the school, the duration of observations ranged from thirty-five to seventy minutes. During each class the IEC was completed and, in most cases, tabulated at the end of the day. Following an observation, the participant was refamiliarized with the requirements of each instrument. All forms were personally distributed and collected by the author.

After the observation schedule had been completed, classroom task descriptions were submitted for rating to a member of the Faculty of Education and of the Faculty of Business Administration. A member of the experimental population was asked to complete the Position Power checklist.

Phase V - Data Processing

Aggregate scores for each variable and/or instrument were first calculated. Where participants had indicated a range of weekly hours for teaching, the
median was computed and subsequently used. First year teachers were considered to have one year's experience. Where there was a discrepancy in task ratings, those of the Faculty of Education expert were given precedence over those of the Business Administration expert because of the former's greater familiarity with the education setting. A new variable, combined workload, was created by consolidating weekly hours spent in teaching and coaching related activities for group B₂. Subject areas observed infrequently were combined to form a single subject, such as typing and business (commerce) as well as electronics and drafting (industrial arts). With information provided in A Theory of Leadership Effectiveness (59), and that obtained from personal communication with Fiedler (61), scores on the instruments associated with the 'contingency' model were coded, collated, and classified into octants on the basis of previously disclosed parameters. Data were then identified as to their statistical quality (see Table 3). Nominal and ordinal data were assigned values and all data were then transferred onto A714 Fortran statement cards (see Appendix F).

Hypotheses

The following hypotheses which were formulated coincidentally with the identification of the research problem and associated subproblems were tested:
TABLE 3
CLASSIFICATION OF VARIABLES ACCORDING TO STATISTICAL QUALITY

<table>
<thead>
<tr>
<th>Classification</th>
<th>Variable</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nominal</td>
<td>Teacher's sex</td>
</tr>
<tr>
<td></td>
<td>Subject taught</td>
</tr>
<tr>
<td>Ordinal</td>
<td>Grade level</td>
</tr>
<tr>
<td></td>
<td>Favorableness</td>
</tr>
<tr>
<td>Interval</td>
<td>IPC, GAS, IEC</td>
</tr>
<tr>
<td></td>
<td>Task Structure</td>
</tr>
<tr>
<td></td>
<td>Position power</td>
</tr>
<tr>
<td>Ratio</td>
<td>Teaching experience</td>
</tr>
<tr>
<td></td>
<td>Coaching experience</td>
</tr>
<tr>
<td></td>
<td>Hours teaching</td>
</tr>
<tr>
<td></td>
<td>Hours coaching</td>
</tr>
</tbody>
</table>
1. \( H_0 \): There is no significant difference in the teacher/coach's behavior in the classroom when coaching as compared to when not coaching.
\( H_1 \): There is a significant difference in the teacher/coach's behavior in the classroom when coaching as compared to when not coaching.

2. \( H_0 \): There is no significant difference in the classroom teaching behavior of teacher/coaches while coaching from that of non-coaching teacher/coaches.
\( H_1 \): There is a significant difference in the classroom teaching behavior of teacher/coaches while coaching from that of non-coaching teacher/coaches.

3. \( H_0 \): There is no significant difference in the favorableness of the leadership situation between teacher/coaches and non-coaching teacher/coaches while the former is (a) coaching and (b) not coaching.
\( H_1 \): The favorableness of the leadership situation between teacher/coaches and non-coaching teacher/coaches is greater while the former is (a) coaching and (b) not coaching.

4. \( H_0 \): There is no significant difference in the favorableness of the leadership situation for teacher/coaches while coaching as compared to when not coaching.
\( H_1 \): There is a significant difference in the favorableness of the leadership situation for teacher/coaches while coaching as compared to when not coaching.
5. \( H_0 \): There is no significant relationship between situational favorableness and the classroom teaching behavior of teacher/coaches when (a) coaching and (b) not coaching.

\( H_1 \): There is a significant relationship between situational favorableness and the classroom teaching behavior of teacher/coaches when (a) coaching and (b) not coaching.

6. \( H_0 \): The time devoted to teaching related activities is not significantly related to the classroom teaching behavior of teachers in this study.

\( H_1 \): The time devoted to teaching related activities is significantly related to the classroom teaching behavior of teachers in this study.

7. \( H_0 \): There is no significant difference in the time devoted to teaching related activities by teacher/coaches than that devoted by non-coaching teacher/coaches.

\( H_1 \): The time devoted to teaching related activities by teacher/coaches is less than that devoted by non-coaching teacher/coaches.

8. \( H_0 \): There is no significant difference in the time devoted to teaching related activities by teacher/coaches when coaching as compared to when not coaching.

\( H_1 \): The time devoted to teaching related activities by teacher/coaches is less while coaching than when not coaching.
9. \( H_0 \): The time devoted to coaching activities is not significantly related to the classroom teaching behavior of teacher/coaches.

\( H_1 \): The time devoted to coaching activities is significantly related to the classroom teaching behavior of teacher/coaches.

**Statistical Analysis**

The Statistical Package for the Social Sciences (SPSS) was used to perform all statistical analyses. Assumptions associated with each of the tests were followed as closely as possible. Using each interval and ratio level variable as the dependent variable, analysis of variance (ANOVA) tested the equality of groups for each of the variables. Employing IEC scores as the dependent variable (criterion), and suitable variables as independent (predictors), multiple regression analysis provided the best linear prediction equation for teaching behavior. All cases were run initially, then, because measures of coaching hours applied only to group B₂, this group was run independently. Chi square, which tests the independence of two or more classificatory variables (crosstabulations), was used, in a manner similar to ANOVA, to test the dependence of all variables on group membership. Additionally, with IEC scores as the dependent variable, chi square was also used to test for a systematic relationship between IEC and all other variables. Again, an overall analysis and an
in-depth analysis of group B₂ were conducted. The independence of IEC and situational favorableness, the former as the dependent variable and the latter as the independent variable, for each of the experimental groups A₁, B₂, and B₃, was examined by chi square.

Statistical Decision

Rejecting a null hypothesis which is true is a Type I error, while accepting a false null hypothesis is a Type II error. Alpha is the probability of committing a Type I error (98:17). Reducing this probability increases that of a Type II error. Although the study is somewhat exploratory, and should serve to encourage future research, the practical importance of the problem is such that caution seems advisable if recommendations forwarded in this study are to be considered, and possibly acted upon, by the Ontario Ministry of Education. Therefore, more protection in favor of a Type I error than a Type II error seems indicated. On that basis, the alpha level for all statistical decisions was set at .05.

Phase VI - Communication

The feedback of the findings in this thesis to the participants and the Ministry of Education represents the fulfillment of this phase of the research program.

Limitations

Several weaknesses in the underlying theory and methodology impose stringent limitations on this thesis.
Typical of *ex post facto* research, direct manipulation and random assignment of subjects to experimental and control groups was impracticable. The basic assumption that observable teaching behavior is related to student learning and achievement is dubious. The selection of the observer, and observer reactivity, may have introduced bias or error into the observation results. Substantially divulging the problem, purposes, and design of the study to the participants may have further distorted subject behavior. All observations were less than the recommended two hours. This thesis represents the initial extension of the IEC into a secondary school setting, and with experienced teachers. In addition, results are limited to the extent to which the philosophy represented by the IEC is subscribed to and reflected in the behavior of teachers.

The 'contingency' model has not been extensively validated in the school environment. The associated instruments may not be entirely appropriate under such circumstances. Zero-cell frequencies in some cross-tabulations, and small N's in some analyses were encountered. These weaknesses, in addition to the exploratory nature of the study, where broad generalizations seem premature, recommend that generalizations be confined to the defined populations.
CHAPTER IV

RESULTS AND DISCUSSION

The action phase of the research program encompassed ninety-one observations of teacher/coaches in eleven different subject areas and five grade levels (see Appendix F). The selection of appropriate statistical analyses reflected a three-fold concern: (1) an assortment of hypotheses; (2) variety in the quality of data accumulated; and (3) the certainty of final conclusions. Data suited to one analysis were often inappropriate for another, and by careful management of the data, one statistical procedure could be used to supplement another. Moreover, analyses examined relationships from a broad to a specific perspective. In the macro-analysis the kinds of leadership situations in which participants were observed are first described. The distribution of leadership, teacher, and observational variables and, in particular, the variability of teaching behavior among observation groups from pre-season to post-season observations is then examined with analysis of variance and other significance tests. Multiple regression analysis is used to describe the relationships between these variables and teaching behavior. Synthesizing information provided by these
statistical techniques, the observed trends in teaching behavior are interpreted and discussed in relation to the possibility of a coaching effect. Finally, a micro-analysis of the teacher/coaches observed during the track and field season provides preliminary insights into the interrelationships between teaching behavior and leadership, teacher, and coaching variables.

Macro-analysis

Confidence was placed in established reliabilities for each of the data collection instruments. These instruments and their corresponding reliabilities are summarized as follows:

1. Intern Evaluation Checklist = .92 (interrater) (133:23);
2. Least Preferred Coworker = .85-.95 (split-half) (59:47);
3. Group Atmosphere Scale = .90 (split-half) (59:163);
4. Hunt's Task Structure Rating Form = .86 (interrater) (59:173);

The Leadership Situations

Mean scores for the instruments associated with the situation component of the 'contingency' model (see Appendix G), viz, the Group Atmosphere Scale (GAS), Hunt's Task Structure Rating Form, and the Position Power Checklist,
in conjunction with previously disclosed parameters; identified an intermediately favorable leadership situation (Octant V). The intermediately favorable leadership situation is characterized by moderately poor leader-member relations, a highly structured task, and strong leader position power. Moderately poor teacher-student relations denote that the teacher and students did not get along particularly well; some dissension existed, but compliance from students could be obtained, although with reservation (59:30). Thus while not earnestly accepting the teacher's influence, students would not necessarily have mitigated against it. Highly structured tasks can be performed in only a limited number of ways which are well defined and easily enforced (59:28). Har- greaves (78) and Lutsk (102) note that providing structure to the classroom environment is a method by which student conformity to roles which are considered to be conducive to learning can be ensured. Structured learning activities would have served to reinforce the teacher's authority. The high position power score verified the existence of formal authority inherent in the teacher's position. This result was anticipated on the basis of sociological theory in education (78, 102, 157). The teacher's ability to convince students to accept his/her influence should have been facilitated (59:25). Situations of interme- diate favorableness were seemingly typical for all obser-
vation groups in that neither analysis of variance (ANOVA) nor chi square, which are discussed more fully below, found observation groups to differ significantly with respect to these situational variables. On the basis of these results, control over situational variability, although post factum, would seem to have been achieved.

Analysis of Variance

ANOVA tests the null hypothesis that the mean scores of two or more groups for some variable are equal. The total variance among these scores is comprised of variation among scores within the group as well as the variation of group means about the overall mean (156:307). The ratio of the between groups to within groups variance is the F ratio. A series of one-way ANOVA's failed to find significant differences among observation groups for all but two variables: IEC (teaching behavior) ($F=8.98, p<.000$) and teaching experience ($F=4.25, p=.002$). As Table 4 shows, significance was almost obtained with respect to the variable LPC (leadership style) ($F=2.312, p=.052$).

Chi square is a non-parametric analytic procedure which was employed as an adjunct to ANOVA. A "cross-tabulation ... is a joint frequency distribution of cases as defined by the categories of two or more variables" (93:70). While making no assumptions about the population from which a sample has been drawn, chi square tests
<table>
<thead>
<tr>
<th>Variable</th>
<th>Degrees of freedom</th>
<th>F Ratio</th>
<th>Probability</th>
</tr>
</thead>
<tbody>
<tr>
<td>Teaching experience</td>
<td>76</td>
<td>4.257</td>
<td>.002*</td>
</tr>
<tr>
<td>Coaching experience</td>
<td>76</td>
<td>1.630</td>
<td>.16</td>
</tr>
<tr>
<td>Hours teaching</td>
<td>80</td>
<td>.287</td>
<td>.91</td>
</tr>
<tr>
<td>LPC</td>
<td>72</td>
<td>2.31</td>
<td>.052</td>
</tr>
<tr>
<td>GAS</td>
<td>78</td>
<td>.435</td>
<td>.824</td>
</tr>
<tr>
<td>IEC</td>
<td>85</td>
<td>8.981</td>
<td>.000*</td>
</tr>
<tr>
<td>Task structure</td>
<td>81</td>
<td>.869</td>
<td>.50</td>
</tr>
</tbody>
</table>

*P = .05
the null hypothesis that obtained frequencies are equal to the expected frequencies (123:295). Small chi square values signify that the variables are statistically independent, while larger values denote a systematic relationship. Chi square revealed that only the variable IEC was systematically related to observation groups (p=.0028), thus partly corroborating the series of one-way ANOVA's (see Appendix H).

The t-test is a special case of ANOVA (t²=F) applied in instances where only two group means are involved. Significant t-values indicate that the larger of the two means is significantly larger (98:276). IEC and teaching experience, on which observation groups differed significantly, and LPC, which approached significance with ANOVA, were subjected to t-tests in order to locate specific significant between group differences. As illustrated in Appendix I, significant differences with respect to teaching experience were found between experimental subgroups A and B (t=2.34, p=.027), and between experimental subgroup B and control group C (t=-3.21, p=.003). Significant differences for LPC were evidenced between observation group A₁, teacher/coaches observed prior to the track and field season, and B₂, teacher/coaches observed during their coaching season (t=2.67, p=.013), and groups B₂ and C₂, non-coaching teacher/coaches observed during the season (t=-2.56, p=.017) as well (see Appendix J).
In reference to IEC, significant t-values were obtained for contrasts between observation groups A₁ and B₂ (t=3.66, p=.001); groups B₂ and C₂ (t=2.14, p=.04); and groups C₂ and C₃ (t=2.81, p=.009) as presented in Table 5.

The teacher/coaches who were observed during their coaching season, group B₂, proved to be less experienced and more task-oriented (intermediate-LPC) than either group A₁ or group C₂ (high-LPC). Interpretations of the LPC measure have tended to focus on the low-LPC (task-oriented) and high-LPC (relationship-oriented) leader to the exclusion of the intermediate LPC leader. Precisely where the intermediate-LPC person fits in the leadership perspective is uncertain. This individual appears to be distinct from high- and low-LPC leaders, being more complex, task-oriented, and efficiency-oriented than either. Fiedler has asserted the need for extensive research on this person (59:50-51). On the other hand, the relationship-oriented leader is discussed extensively. This leader derives primary satisfaction from good interpersonal relations with group members. In intermediately favorable leadership situations the high-LPC leader becomes more concerned with and responsive to group needs, increasing the frequency and intensity of interactions in an effort to improve relations with the group and thus provide need gratification (59:184). Fiedler's data indicate that the relationship-oriented leader tends to be more effective
<table>
<thead>
<tr>
<th>Groups</th>
<th>Degrees of Freedom</th>
<th>$t_T$ Value</th>
<th>Probability</th>
</tr>
</thead>
<tbody>
<tr>
<td>$A_1$</td>
<td>27</td>
<td>3.66</td>
<td>.001*</td>
</tr>
<tr>
<td>$B_2$</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>$A_1$</td>
<td>29</td>
<td>1.01</td>
<td>.32</td>
</tr>
<tr>
<td>$C_1$</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>$B_2$</td>
<td>28</td>
<td>-2.14</td>
<td>.04*</td>
</tr>
<tr>
<td>$C_2$</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>$B_3$</td>
<td>28</td>
<td>-.43</td>
<td>.67</td>
</tr>
<tr>
<td>$C_3$</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>$B_3$</td>
<td>26</td>
<td>1.05</td>
<td>.30</td>
</tr>
<tr>
<td>$B_3$</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>$C_2$</td>
<td>30</td>
<td>1.03</td>
<td>.31</td>
</tr>
<tr>
<td>$C_2$</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>$C_3$</td>
<td>30</td>
<td>2.81</td>
<td>.009*</td>
</tr>
</tbody>
</table>

* $p = .05$
in intermediately favorable leadership situations than the task-oriented leader. On the basis of a task-orientation (intermediate-LPC), group B2 would not have been appropriately suited to the intermediately favorable classroom situation for effective leadership (59:13). Leadership effectiveness in this context refers to group performance on the group's assigned tasks (59:9). A validation of the contingency model was precluded in the absence of a common task and a group performance parameter.

The downward trend in teaching behavior apparent for experimental and control groups from pre-season to post-season observations (see Figure 3) was hypothesized as representing seasonal variation in teaching; each successive set of observations was performed closer to the termination of the school year, post-season observations within one month of that occasion. In order to explore the possibility of a seasonal effect, the independence of rankings for each of the IEC's twenty-nine categories and the time of observation, viz., pre-, in-, and post-season, was tested by means of chi square. Cases from the control group were analyzed. Although only a single significant chi square was obtained, a consistent trend with respect to rankings was noted. On sixteen of the categories a reduction in outstanding or satisfactory rankings and a concomitant increase in unsatisfactory or unobserved rankings, particularly from in-season to post-season.
Fig. 3. Teaching behavior over time (rescaled to the grand mean).
was evidenced, providing support for a seasonal effect on teaching behavior.

In addition to receiving significantly lower scores on the IEC than either group A₁ or group C₂, observation group B₂, track and field teacher/coaches observed during their coaching season, was significantly less experienced and more task-oriented (intermediate-LPC) than group A₁ and group C₂ (relationship-oriented). Equivalence among the observation groups on the remaining teacher, observational, and situational variables eliminate these variables as alternative explanations to a coaching effect for the significant between groups differences on the IEC in that the effect of a particular variable would be similar for all groups. However, the variables teaching experience and LPC represented potential explanations for the differences related to the IEC. The viability of these two variables as rival hypotheses to a coaching effect was contingent upon whether one or both were significantly related to IEC (teaching behavior). Stepwise multiple regression analysis was utilized to test these possibilities.

Multiple Regression

Multiple regression analysis is both a descriptive and an inferential statistical tool. In a descriptive capacity, multiple regression finds the best linear prediction equation for a criterion from a set of predictors.
The coefficient of determination (R square) is the index of the proportion of total variance in the criterion accounted for by predictors in the equation. In an inferential role, multiple regression examines the statistical significance of the relationship represented by the regression equation (F value) (123:321). Stepwise multiple regression analysis is appropriate where relationships among variables are not already known. The forward stepwise multiple regression procedure first selects the predictor which explains the most variance in the criterion; the best prediction model at step one. At each subsequent step the variable which accounts for the greatest amount of variance remaining after that accounted for by previous variables has been removed is selected. The selection process continues until no variables which will maintain the significance of the regression equation remain. Caution is advised when using multiple regression analysis in cases where two or more independent variables are highly correlated, a condition referred to as multicollinearity (123:340). Two alternative courses of action may be followed where multicollinearity is involved: (1) unite the correlated variables in some way, or (2) use one of the correlated variables to represent the underlying dimension (123:341).

Multicollinearity was initially found between coaching experience and teaching experience (r=.88),
which implies that teacher/coaches who had taught longer had also coached longer, and that they began to coach almost when they began to teach. The problem presented by multicollinearity was alleviated by including only teaching experience in the variable list, representing the underlying concept of experience. This choice was made on the rationale that a direct examination of the relationship between teaching experience and IEC was essential in lieu of the relevance of an experience differential as a possible alternate explanation to involvement in coaching per se for significant groups $A_1$-$B_2$, and $B_2$-$C_2$ differences on the IEC.

Of the variables which were included in a second stepwise multiple regression analysis (see Appendix K), four contributed to produce the best overall significant prediction equation for IEC; viz., teaching (coaching) experience, task structure, hours teaching, and GAS (see Table 6). Teaching experience represented the best one variable model, accounting for 11.8% of the total variance in IEC. Subsequent to teaching experience, task structure was added in the best two variable model, accounting for 1.7% total variance in IEC; teaching hours, the best three variable model, accounting for .4% of the total variance; and GAS (leader-member relations), the best four variable model, accounting for .04% of the total variance in IEC ($R^2 = .142, p < .05$).
### TABLE 6
STEPPWISE MULTIPLE REGRESSION MACRO-ANALYSIS

<table>
<thead>
<tr>
<th>Variables in the equation</th>
<th>Beta</th>
<th>Standard error</th>
<th>R square</th>
<th>F ratio</th>
<th>Probability</th>
</tr>
</thead>
<tbody>
<tr>
<td>Teaching experience</td>
<td>.344*</td>
<td>.147</td>
<td>.118</td>
<td>9.43</td>
<td>.005</td>
</tr>
<tr>
<td>Teaching experience</td>
<td>.328</td>
<td>.148</td>
<td>.136</td>
<td>5.45</td>
<td>.01</td>
</tr>
<tr>
<td>Task structure</td>
<td>- .134</td>
<td>.158</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Teaching experience</td>
<td>.321</td>
<td>.150</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Task structure</td>
<td>- .153</td>
<td>.164</td>
<td>.141</td>
<td>3.73</td>
<td>.025</td>
</tr>
<tr>
<td>Hours teaching</td>
<td>- .073</td>
<td>.083</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Teaching experience</td>
<td>.320</td>
<td>.151</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Task structure</td>
<td>- .154</td>
<td>.166</td>
<td>.142</td>
<td>2.77</td>
<td>.05</td>
</tr>
<tr>
<td>Hours teaching</td>
<td>- .076</td>
<td>.085</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>GAS</td>
<td>-.020</td>
<td>.061</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*P = .05
The significance of the direct contribution made by each predictor to the reduction of unexplained variance in IEC was determined by examining the standardized regression coefficients (beta weights) which indicate the proportion of the standard deviation of the dependent variable accounted for by an independent variable with the effects of all other variables that precede either of the two variables removed (9:32).

At each step the last beta weight is the expression of the direct relationship between the criterion and the regressor at that step. The standard error of the estimate associated with the beta weight is multiplied by 1.96 (p=.05) to provide the critical Z values for the partial regression coefficient. A variable with a coefficient which equals or exceeds the critical Z value is a significant direct predictor of the criterion. Teaching (coaching) experience proved to be the only regressor to significantly reduce unexplained variance in IEC.

Chi square tested the independence of IEC scores and all other variables (see Appendix L) in a supplementary role to multiple regression analysis. As in the regression analysis teaching hours and task structure were found to be systematically related to IEC. Continuing further with this strategy, in order to determine whether situational favorableness was differentially related to IEC for teacher/coaches while coaching vis-à-vis not coaching, experimental groups A₁, B₂, and B₃ each
were analyzed independently. No significant chi square values were obtained, indicating that scores on the IEC for teacher/coaches were independent of the favorableness of the leadership situation, and that this independence was maintained during and outside of their coaching season. That is, there was nothing about the leadership situations in which teacher/coaches were observed while coaching which predisposed these teacher/coaches to behave differently in the classroom insofar as the IEC is concerned than when they were not coaching.

The results of the multiple regression analysis indicated a significant, direct, and positive relationship between teaching experience and IEC; experienced teacher/coaches exhibited greater proficiency in the communication management skills measured by the IEC than inexperienced teacher/coaches. Research, to date, suggests that teaching behavior is in fact a function of experience in the teaching role (57, 62). The remaining variables in the analysis were indirectly related to the criterion, modulated through teaching experience, or in the case of LPC, excluded from the significant prediction equation. The exclusion of LPC from the prediction equation asserts the point that being task- or relationship-oriented was not a factor influencing the scores received on the IEC; task-oriented and relationship-oriented leaders could score equally as high or
low. Therefore, although group B₂ was significantly more task-oriented (intermediate-LPC) than either group A₁ or group C₂ (relationship-oriented), this factor in isolation is unlikely to have led to the coinciding differences on the IEC. However, in the event of a counterproductive coaching effect at B₂, the effect may be true only for intermediate-LPC and/or task-oriented teachers. The exclusion of LPC from the prediction equation may also reflect a curvilinear relationship between leadership style and teaching behavior. Fiedler has indicated that there is no one-to-one relationship between the LPC measure and leader behavior (59:45). In this case, the use of multiple linear regression to estimate the relationship would be anticipated to yield a weak or near zero-order relationship. A discussion of the full ramifications of the indirect relationships implied in the prediction equation for IEC, although of possible relevance to teaching oriented research in a general context, would be tangential to the issue at hand and will not, on that basis, be pursued. The important result rather is that teaching (coaching) experience and IEC were significantly and positively related.

The implication of the significant positive relationship between teaching behavior (IEC) and teaching experience (r=.34) is relevant since group B₂, which was observed while concomitantly involved in coaching, was
less experienced than either group $A_1$, observed before the track and field season, or group $C_2$, observed after the season. Significantly lower IEC scores for group $B_2$ could simply have reflected the experience differential and not a coaching effect. Controlling for teaching experience through analysis of covariance allowed the hypothesis that the respective observation groups were not significantly different in terms of the IEC to be retested. This tactic was adopted and significant differences for both the groups $A_1-B_2$ ($F=2.808$, $p=.038$), and $B_2-C_2$ ($F=2.949$, $p=.035$) contrasts on the IEC were maintained. The likelihood that the differences in teaching behavior were an experience artifact is further reduced by examining post-season observations. An experience factor operational during the season at $B_2-C_2$ would be expected to be similarly manifest following the season at $B_3-C_3$, where the same experience differential existed. Post-season IEC scores for groups $B_3-C_3$ were not, however, significantly different. The significant differences in IEC scores between groups $A_1$ and $B_2$, and between groups $B_2$ and $C_2$ would therefore not appear to be attributable to the coinciding difference in teaching experience, or in leadership style, thus elevating the possibility of a coaching effect.

Analysis of the Trends in Teaching Behavior

The classroom teaching behavior of control and
experimental groups for pre-season and post-season observations was equivalent, but not for in-season observations, concurrent with the treatment-coaching. However, group B₂, teacher/coaches observed during their coaching season, experimental subgroup A₁ and control group C₂ were not homogeneous. Teacher/coaches in group B₂ were significantly less experienced and more task-oriented (intermediate-LPC) than those in group A₁ and the non-coaching teacher/coaches in control group C₂. In addition, group B₂ coached interschool track and field. The viability of the experience and leadership style differential accounting for the coinciding differences in teaching behavior was statistically, and logically, reduced. A coaching effect can therefore be argued.

Situational, observational, and teacher oriented variables related to the control group from pre-season to post-season observations, and to experimental subgroup B, from in-season to post-season observations, remained stable. The pre-season equivalence of experimental subgroup A and control group C, in conjunction with the post-season equivalence of control group C and subgroup B, both in reference to teaching behavior, implies an expected equivalence of the respective subgroups. Control group C and experimental group B remained stable, with respect to leadership, teacher, and observational variables, from in-season to post-season obser-
vations. While their teaching behavior on post-season observations was equivalent, this was not the case for in-season observations, although each group had not changed significantly. If subgroup B was normally less proficient than group C, irrelevant to a coaching effect, a similar difference on post-season observations as evidenced for in-season observations would have been expected. Instead, post-season teaching behavior for groups observation C3 and B3 was not significantly different. Group C3 appears to reflect a seasonal effect on teaching behavior; deterioration toward the end of the school year. This decline is not readily apparent for subgroup B from B2, while coaching, to B3, while not coaching. A coaching effect at B2 would seem to have been replaced by a seasonal effect at B3, which is more clearly evident for the control group from C2-C3. On that basis, coaching and seasonal effects appear to be similar; a reduction in the variety and quality of communication management skills employed by the teacher/coach. A coaching effect at B2-C2 supports a coaching effect between A1, not coaching, and B2, coaching. On this basis, reason to suspect a coaching effect exists. The fact that only fourteen percent of the variance in teaching behavior (IEC) was accounted for by variables in the regression analysis suggests that the significant groups A1-B2 and B2-C2 differences in behavior are par-
tially attributable to the main effects of one or more unmeasured variables, and/or their interaction with a coaching factor, on teaching behavior. Additional factors which could have contributed to create these differences include observer bias and reactivity. An indication of the actual effect of coaching on observation group B₂, and in the event of such an effect, its magnitude, was contingent upon the in-depth analysis of the track and field teacher/coaches during their coaching season.

**Micro-analysis**

Teacher/coaches in group B₂ were actively involved in coaching interschool track and field. An in-depth analysis of group B₂, performed with multiple regression procedures, would enable a direct examination of the question of whether coaching demands were a significant predictor of classroom teaching behavior.

Measures of coaching hours and combined workload (teaching and coaching hours) were obtained for group B₂. Multicollinearity again proved a problem. High correlations found between combined workload and both teaching hours ($r = .81$) and coaching hours ($r = .72$) were understandable in that combined workload was a composite of the other two variables. As was the case in the macro-analysis, teaching and coaching experience were also highly correlated ($r = .90$). Consequently, the variables
combined workload and teaching experience were deleted from the second analysis, the latter under the premise that coaching experience could be an important factor in regards to a relationship between coaching demands and teaching behavior. Each of the six remaining variables, namely, coaching experience, hours teaching, hours coaching, GAS, task structure, and LPC (see Appendix M) contributed to collectively account for 78.1% (R square = .781) of the unexplained variance in IEC scores (F = 4.16, p < .05) (see Table 7).

Coaching (teaching) experience constituted the best one variable prediction model, reducing unexplained variance by 62.9%. Subsequent to coaching experience, teaching hours was added to produce the best two variable model, contributing 6.5% explained variance in IEC; coaching hours, the best three variable model, contributing 5.7% explained variance; GAS, the best four variable model, contributing 2.1% explained variance; task structure, the best five variable model, contributing .4% explained variance; and LPC, the best six variable model, contributing .3% explained variance in IEC scores. The significance of contributions made by each of the variables to the prediction of IEC was again determined as previously outlined. Coaching (teaching) experience, hours teaching, and hours coaching each proved to have a significant direct effect (p = .05) on IEC teaching behavior.
### TABLE 7
**STEPWISE MULTIPLE REGRESSION MICRO-ANALYSIS**

<table>
<thead>
<tr>
<th>Variables in the equation</th>
<th>Beta</th>
<th>Standard error</th>
<th>R^2</th>
<th>P ratio</th>
<th>Probability</th>
</tr>
</thead>
<tbody>
<tr>
<td>Coaching experience</td>
<td>.793</td>
<td>.221</td>
<td>.629</td>
<td>20.370</td>
<td>&lt; .001</td>
</tr>
<tr>
<td>Coaching experience</td>
<td>.874</td>
<td>.220</td>
<td>.694</td>
<td>12.514</td>
<td>&lt; .005</td>
</tr>
<tr>
<td>Hours teaching</td>
<td>.266</td>
<td>.079</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Coaching experience</td>
<td>.938</td>
<td>.215</td>
<td>.752</td>
<td>10.116</td>
<td>&lt; .005</td>
</tr>
<tr>
<td>Hours teaching</td>
<td>.337</td>
<td>.077</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hours coaching</td>
<td>.252</td>
<td>.088</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Coaching experience</td>
<td>.954</td>
<td>.218</td>
<td>-773</td>
<td>7.678</td>
<td>&lt; .01</td>
</tr>
<tr>
<td>Hours teaching</td>
<td>.355</td>
<td>.078</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hours coaching</td>
<td>.241</td>
<td>.089</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>GAS</td>
<td>.147</td>
<td>.086</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Coaching experience</td>
<td>.971</td>
<td>.234</td>
<td>.777</td>
<td>5.606</td>
<td>&lt; .025</td>
</tr>
<tr>
<td>Hours teaching</td>
<td>.387</td>
<td>.092</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hours coaching</td>
<td>.251</td>
<td>.095</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>GAS</td>
<td>.076</td>
<td>.204</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Task structure</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Coaching experience</td>
<td>.979</td>
<td>.251</td>
<td>.781</td>
<td>4.16</td>
<td>&lt; .05</td>
</tr>
<tr>
<td>Hours teaching</td>
<td>.376</td>
<td>.096</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hours coaching</td>
<td>.204</td>
<td>.128</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>GAS</td>
<td>.193</td>
<td>.109</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Task structure</td>
<td>.069</td>
<td>.218</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>LPC</td>
<td>.077</td>
<td>.055</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

\*P = .05
The emergence of a direct and significant negative relationship between coaching hours and teaching behavior represents a counterproductive effect by coaching. In light of this finding, support for a coaching effect in relation to the groups A₁-B₂ and B₂-C₂ significant differences in teaching behavior is provided, although the relative effect of coaching amongst the effects of other variables in the teaching-learning environment is not evident. An intimation of the relative effect of coaching demands on teaching behavior was afforded through causal analysis procedures.

Causal Analysis

Causal analysis is a descriptive function of multiple regression analysis. Causal relationships among a set of variables are identified, thus providing explanations for complex multivariate situations (123:321). The magnitudes of direct and indirect effects of each variable on other variables in the analysis are determined. The causal order of the variables is designated, in this instance, by the stepwise regression procedure. Only the standardized partial-regression coefficients (beta-weights) and associated standard error of the estimates are required. The significance of partial regression coefficients is determined as previously outlined. For the best one variable model the procedure is straightforward. However, in the case of the best two
variable model two beta weights are necessarily involved. The first beta weight represents the relationship between the newest variable and the first (the indirect effect on the criterion); the second beta, the relationship between the newest variable and the criterion (direct effect). For the best three variable model, the first beta is the relationship between the first predictor and the latest; the second beta, the relationship between the latest predictor and the second; and the third, the relationship between the newest predictor and the criterion. This process expands for each additional variable. Only significant partial regression coefficients are mapped to yield the causal model. This study is of both a descriptive and an experimental nature. Stepwise multiple regression not only tests a priori hypotheses, but also tests numerous unformulated hypotheses among a set of variables (105:366). On this basis, a causal model which would (1) provide primary insight into the relationships among leadership, teaching, and coaching variables in particular, as they interact to influence teaching behavior, and (2) provide new avenues for future research was constructed from Table 7 above (see Figure 4).

The interpretation and discussion of causal models commonly involves the most parsimonious explanation of relationships regardless of the directions of causal arrows. The most notable direct relationship evidenced
Fig. 4. A causal model for teacher/coaches during the coaching season.
in the model is that experienced track and field teacher/coaches exhibit greater proficiency in communication management skills than less experienced teacher/coaches (coaching experience-teaching behavior=.79). As noted in the macro-analysis, teaching behavior appears to be a function of experience. The experienced teacher/coach was also a more relationship-oriented (high-LPC) leader; derives need gratification primarily from favorable relations with group members (LPC-coaching experience=.97). Conversely, less experienced teacher/coaches tend to be more task-oriented (low-LPC) leaders; derive need gratification primarily from successful task performance. New teachers may initially consider successful task-performance to be essential to job survival. As their teaching behavior develops with experience, the less experienced teacher/coach may become more concerned with establishing good interpersonal group relations with group members. Fiedler indicates that leadership style seems to change with experience in the leadership role (59:48). The experienced teacher/coaches in the macro-analysis were in fact more relationship-oriented than the inexperienced teacher/coaches.

Experienced teacher/coaches are involved with highly structured learning activities (coaching experience-task structure=.97). Relationship-oriented leaders are not ordinarily expected to be especially concerned with
tasks unless such concerns can lead to better interpersonal relations with the group (59:46). Stogdill indicates that group members often prefer structure and that they are apprehensive of role and task ambiguity (172:313). Role ambiguity as a significant potential source of conflict has been acknowledged (41, 78, 174). One of the leaders' functions is to provide role and task definitions, without which group members may become dissatisfied and resist the leader (172:292). Brophy and Evertson indicate that the appropriateness of the content- or process-centered teaching style is determined largely by the age and intellectual development of the students (29). Structured, content-centered activities for secondary school students may be more commensurate with their development level than more open activities. Experienced teacher/coaches may be conscious of student expectations for role definition and thus concern themselves with structuring classroom activities as a means to satisfy these expectations and thereby generate favorable relations with the group. Structured tasks provide role definition in that there are a limited number of ways in which they can be performed. As such, structured learning activities possess the potential of satisfying a student need for a defined classroom role. Learning activities may also undergo a process of refinement accompanying an increase in teaching experience.
The teacher/coach's influence with students should be reinforced by a structured task (59:27). The amount of time spent in teaching related activities increases when structured classroom activities are involved (task structure-teaching hours = .38), perhaps with respect to preparation time. Experienced teacher/coaches do in fact seem to assign a greater amount of time to teaching related activities, more so than inexperienced teacher/coaches (coaching experience-teaching hours = .87). Involvement with less highly structured learning activities may account for the discrepancy in the amount of time spent in teaching related activities associated with the inexperienced teacher/coach. Structured activities, which inherently should provide a measure of role specification, should lead to fulfillment of student needs and expectations for a defined classroom learning role. On this basis, the perception of student acceptance by experienced teacher/coaches, who taught more highly structured learning activities, and the perception of rejection by inexperienced teacher/coaches, who taught less highly structured activities, would be explained. Student dissatisfaction as perceived by the inexperienced teacher/coach may be associated with failure to satisfy student role expectations and needs. Unfavorable teacher-student relationships may also be reflective of the fact that the inexperienced teacher has had neither extensive exposure
to students nor sufficient time to adjust to the teaching role. Collectively, inexperience, failure to satisfy student role expectations, and an association with unstructured learning activities, which by nature would dilute teacher influence with students, may explain why the inexperienced teacher/coach appears to be less proficient in classroom teaching than experienced teacher coaches.

Experienced, relationship-oriented teacher/coaches devote substantially more time to teaching related activities than inexperienced teacher/coaches (coaching experience-teaching hours=.87; and LPC-teaching hours=.37). An increase in the time spent in teaching related activities leads to an improvement in classroom teaching behavior (teaching hours-TEC=.26). As a possible consequence of satisfying student needs and expectations for role definition, and probably as a result of considerable exposure to the student body, experienced teacher/coaches perceived acceptance by the students (GAS-coaching experience=.95; and GAS-teaching hours=.38). In addition, Fiedler indicates that the relationship-oriented leader in a coaching group (or classroom) situation can have a quasi-therapeutic effect on group members such that they are satisfied with group membership, themselves, and their tasks (59:51; 221). These individuals may be having such an effect and be perceiving such a result.
Thus, the authority inherent within structured tasks, good teacher-student relations, and overall experience as a teacher/coach could contribute to an improvement in classroom teaching behavior.

Concomitant with an increase in the amount of time devoted to coaching related activities is a suppressive effect on teaching behavior (coaching hours-TEC=.25). The teacher/coaches assigning more time to coaching related activities were experienced and therefore, relationship-oriented (coaching hours-coaching experience=.93). Additional time spent in coaching could reflect the possibility that experienced teacher/coaches assume the administrative responsibilities of the track and field team in addition to those of coaching, and/or variability with respect to the time demanded by different track and field events. The teacher/coach who spent more time engaged in coaching activities taught less structured classroom activities (coaching hours-task structure=-.25), which presents a contradiction in that experienced teacher/coaches generally tended to teach classroom activities of a highly structured nature. This contradiction suggests the existence of two distinct groups of experienced track and field teacher/coaches, distinguished on the basis of the nature of the classroom activities each taught and the amount of time each spent in coaching related activities.
Assuming a systematic relationship between the amount of time spent in coaching activities and the structure of classroom learning activities, coaching could be hypothesized as having depleted the time which task structuring appears to require. Consequently, the lack of structure of the classroom activities may represent improvisation by the teacher/coach. These individuals felt somewhat rejected by their students (GAS-coaching hours = -.24). The ambiguity of the unstructured learning activities would not lead to satisfaction of student preferences for a defined classroom role, which would precipitate student dissatisfaction and rejection of the teacher; ergo, the perception of rejection. The failure to fulfill role expectations, and role ambiguity represent substantial potential resources of conflict. Emmer, Oakland, and Peck (52) indicate that negative student behavior tends to precipitate negative teacher behavior. In this context, the negative student relations in conjunction with a negative effect on teaching behavior would reinforce Fiedler's contention that leader-member relations are the most important element in small groups.

The absence of a significant direct relationship between task structure and leader-member relations, with results found by Fiedler showing a near zero-order correlation (r = .03) (59:153), implies that unfavorable teacher-student relations in this instance seem to be
more a function of the teacher/coach's ability to fulfill student role expectations via structured learning activities, than of the tasks themselves. The leadership situation confronting the experienced, relationship-oriented teacher/coaches who coached more was substantially unfavorable; that is, activities were unstructured, teacher-student relations were poor, and teacher position power was strong. The reaction of the relationship-oriented leader would be to increase the frequency and intensity of interactions in an effort to maintain control and satisfy the need for good relations with the group (59:184-85).

This sort of reaction, if channelled through counselling activities would explain why this person also tended to consign more time to teaching related activities (coaching hours-teaching hours = .33).

The absence of a direct relationship between leadership style and teaching behavior is possibly reflective of a curvilinear relationship between the LPC measure and leader behavior which Fiedler has suggested (59:45). The task- and the relationship-oriented leader each will indulge in behavior associated with the opposite need orientation in order to satisfy their own respective needs. Similarly, the quality of leader-member relations does not appear to be a direct function of leadership style, which is reasonable in that the task-oriented leader, like the relationship-oriented leader, will
actively seek favorable relations with group members, but as a means to successfully completing a task. Task structure is not directly related to teaching behavior. Carlisle (33), Fiedler (59) and others would indicate that perhaps it should be. However, based upon relationships suggested in the causal model, the effect of activity structure on teaching behavior appears to be dependent, at least in part, upon its interaction with the type of leader involved and the needs and expectations of the students.

In summary, experienced track and field teacher/coaches are more relationship-oriented and display greater proficiency in communication management skills than less experienced teacher/coaches; that is, leadership style and teaching behavior appear to be functions of experience. The kinds of learning activities which the experienced teacher/coach teaches are structured which, as such, facilitate leader influence while prescribing student behavior. A student preference for a structured or defined classroom role, which structured tasks potentially provide, was hypothesized. Apparently conscious of these student expectations, experienced teacher/coaches concern themselves with structuring classroom activities, which may require more preparation time, but serve to facilitate teacher influence and satisfy student expectations. These factors may account for improved teaching behavior.
Classroom teaching behavior per se is somewhat adversely affected by an increase in the amount of time spent in coaching activities per se, suggesting the possibility of a curvilinear relationship between the time demands of coaching and classroom teaching behavior. The teachers who coached more were both experienced and relationship-oriented, and were associated with less structured classroom activities. Whereas experienced teacher/coaches were generally associated with structured classroom activities, a distinct group of teacher/coaches distinguished on the basis of the time which they devote to coaching activities and the structure of the classroom activities which they taught is suggested. Unstructured learning activities conceivably represent classroom improvisation resulting from a sacrifice of teaching related time for coaching responsibilities. As a result, student needs and expectations for role structuring by the teacher/coach are not satisfied. In an effort to improve the strained relations with students which result, these teacher/coaches increase the frequency of interactions with students, possibly in the area of counselling. In the sense that this teacher/coach assigned more time to coaching and to teaching related activities, and experienced an adverse effect on both teaching behavior and relations with students, Massengale's thesis that the combined workload of teaching
and coaching is the most perceived and experienced source of role conflict for teacher/coaches is somewhat supported. The counterproductive effect of coaching is inconsistent with the perceived positive effect of coaching expressed in written opinionnaires and interviews by respondents in Southwestern Ontario in regard to the SIR study of the role of interschool sports in Ontario. However, perceptions are not necessarily accurate representations of reality, as noted in chapter II. Previous SIR studies have shown perception and actual behavior to be at variance.

Coaching experience appears to be an important factor insofar as the effect of coaching on teaching behavior is concerned. When the variable coaching experience was replaced by teaching experience in the multiple regression analysis, the effect of coaching on teaching behavior became indirect. The correlation between teaching and coaching experience was .90, indicating that some teacher/coaches are less experienced in the coaching role than in the teaching role. The classroom teaching behavior of teacher/coaches who are experienced in both roles may be less adversely affected by coaching than that of teacher/coaches who are similarly experienced as teachers, but who are less experienced as coaches. Coaching experience thus would seem to be a modulating factor in terms of the extent to which teaching behavior is affected by involvement in coaching.
In concluding, the slight but significant counterproductive effect of coaching time demands upon the classroom teaching behavior of track and field teacher/coaches is, in all probability, somewhat offset by other factors in the teaching-learning environment, such as teaching and/or coaching experience. The limited sample size in this in-depth analysis may have inflated the magnitudes of the relationships, and in that teacher/coaches in the sample were task-oriented and inexperienced, the generalizability of this discussion is limited.

Summary

In summarizing the major findings presented in this chapter, the kinds of leadership situations in which experimental and control groups were observed were found to be intermediate in favorableness; that is, characterized by moderately poor leader-member relations, highly structured classroom activities, and strong teacher position power. With the exception of teaching experience, leadership style, and teaching behavior, an equal distribution of situational, teacher, and observational variables among the observation groups was found. Observation group B, track and field teacher/coaches observed during their coaching season, was significantly less experienced, more task-oriented (intermediate-LPC), and received significantly lower scores on the Intern Evaluation Checklist (IEC) than either group A, track
and field teacher/coaches observed prior to the coaching season, or group \( C_2 \), non-coaching teacher/coaches observed during the track and field season.

The results of the multiple regression analysis indicated a significant, direct, and positive relationship between teaching experience and teaching behavior. Experience was then hypothesized to be the source of the significant differences between experimental group \( B_2 \) and control group \( C_2 \) during the track and field season, and between experimental subgroup \( A_1 \) and \( B_2 \) from pre-season to in-season observations. Analysis of covariance removed experience as a factor and the significance of these differences remained. The exclusion of leadership style from the regression equation meant that being task-oriented had not predisposed group \( B_2 \) to receive lower IEC scores. However, in the event of a coaching effect, the effect may have been true only for task-oriented and/or intermediate-LPC leaders. The pre-season and post-season equivalence of experimental and control groups argued in favor of a coaching effect in the case of the groups \( A_1\)–\( B_2 \) and \( B_2\)–\( C_2 \) differences on the IEC. Post-season observations reflected a seasonal deterioration in teaching behavior toward the end of the school year. In addition to a coaching effect, the significant differences in teaching behavior were suspected to partially be the result of one or more unmeasured variables on the rationale
that variables in the overall best multiple regression prediction equation accounted for only 14.2% of the variance in IEC scores.

An in-depth analysis of the track and field teacher/coaches observed during their coaching season, again using multiple regression analysis, found coaching time demands to be significantly, directly, and negatively related to teaching behavior, supporting the contention of a coaching effect suspected in the macro-analysis. However, from a preliminary causal analysis of the inter-relationships among leadership, teaching, situational, and coaching variables, the counterproductive effect of coaching time demands on classroom teaching behavior was hypothesized to have been somewhat offset by other variables in the teaching-learning environment. Furthermore, coaching experience appeared to have an important modulating influence on the extent to which coaching demands affect teaching behavior.
CHAPTER V

ACTION-SUMMARY, CONCLUSIONS
AND RECOMMENDATIONS

This chapter briefly outlines the nature of the problem which was investigated and the steps which were taken to solve it. The evidence found upon analysis of the data which was collected is then summarized, and conclusions based on both the results and the evidence are stated. Finally, recommendations for future action/research are put forward.

Summary

Substantial concern among practitioners in the Southwestern Ontario Secondary School Association for the present status of interschool sports in Ontario and, in particular, for increasing costs, demands for facilities, and pressures on teacher workloads, accompanying a trend toward increased competition, was identified in Chapter I. These concerns prompted an Ontario Ministry of Education research grant on "The Role of Interschool Sports in the Secondary Schools of Ontario-Focus on SWOSSA of OFSAA" which was conducted by the University of Windsor Sports Institute for Research (SIR). Under the terms of the
grant, the Ministry explicitly requested an examination of the time demands placed on teacher/coaches and their resulting effectiveness as teachers in the classroom. This request constituted the primary thrust of this thesis. A supplemental need for the study was exposed with respect to a conspicuous scarcity of literature directly focusing on the teaching/coaching interface. "A Study of the Relationship of Coaching to the Observed Classroom Teaching Behavior of Secondary School Teacher/Coaches" was subsequently instituted for the purpose of determining (1) if the classroom teaching behavior of teacher/coaches while coaching differed significantly from that when not coaching, and (2) the nature of the relationship between classroom teaching behavior and the time demands of coaching.

The second chapter began with an examination of the roles of leader, teacher, and coach, and the identification of elements common to all three. Role behavior in each was found to be influenced by four fundamental factors: (1) the personal constitution of the role actor; (2) the quality of the relationships between the role actor and the group; (3) the organization which provides both the need for the role actor and group as well as the tasks for which they are responsible; and (4) the nature of the situation which the role actor encounters. The interaction between the role actor and group members was represented by a continuum from a task or content orientation
to a group or process orientation. Chapter II then continued with a review of research and development with reference to the measurement and/or evaluation of teacher effectiveness, leadership effectiveness, as well as the teaching/coaching interface. Two fundamental teacher effectiveness criteria were noted: (1) teacher behavior and/or qualities and (2) student academic achievement. Observation techniques demonstrated promising potential with respect to the measurement of teacher behavior.

Although considered the 'ultimate' criterion of teacher effectiveness, student academic achievement exhibited a substantial weakness in terms of the difficulty in isolating a particular teacher's contribution to a particular student's achievement. The 'contingency' model, which hypothesizes relationships between leadership and situational variables, in particular, leadership style, leader-member relations, task structure, and leader position power, was identified as a useful paradigm in leader effectiveness research. Research with a primary focus on the teaching/coaching interface proved both scarce and inconclusive, with support both for and against a counterproductive coaching effect.

The variables which were chosen for measurement on the basis of theory and interaction with both researchers and educators, and the research procedures were outlined in chapter III. Observable classroom teaching behavior
was selected as the criterion and quantified with the Intern Evaluation Checklist (IEC). The 'contingency' model served to account for some of the prominent leadership variables identified in the review of leadership theory, which were assumed to be operative in the teaching-learning environment. This study focused on an experimental group consisting of twenty-nine Essex County Secondary School Association teacher/coaches, divided into two subgroups (A and B), and a control group (C) comprised of sixteen non-coaching teacher/coaches. Experimental and control groups were observed before \( (A_1, C_1) \), during \( (B_2, C_2) \), and after \( (B_3, C_3) \) the track and field season. Data pertaining to the teacher, observation setting, and leadership situation were collected on all of these occasions. Data subsequently were examined using analysis of variance and covariance, stepwise multiple regression, causal analysis, and chi square. These procedures were designed to (1) test the research hypotheses, (2) accommodate diversity in the scale properties of the data, and further, to (3) enhance the certitude of final conclusions. An interpretation and discussion of the results followed in the fourth chapter. The null hypotheses which were tested and the decisions regarding each, along with the corresponding alternate hypotheses, are summarized in Table 8 below.
### TABLE 3
**SUMMARY OF HYPOTHESES AND DECISIONS**

<table>
<thead>
<tr>
<th>Hypotheses</th>
<th>Decision</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.  $H_0$: There is no significant difference in the teacher/coach's behavior in the classroom when coaching as compared to when not coaching. $H_1$: There is a significant difference in the teacher/coach's behavior in the classroom when coaching as compared to when not coaching.</td>
<td>Reject</td>
</tr>
<tr>
<td>2.  $H_0$: There is no significant difference in the classroom teaching behavior of teacher/coaches while coaching from that of non-coaching teacher/coaches. $H_1$: There is a significant difference in the classroom teaching behavior of teacher/coaches while coaching from that of non-coaching teacher/coaches.</td>
<td>Accept</td>
</tr>
<tr>
<td>3.  $H_0$: There is no difference in the favorableness of the leadership situation between teacher/coaches and non-coaching teacher/coaches while the former is (a) coaching and (b) not coaching. $H_1$: The favorableness of the leadership situation between teacher/coaches and non-coaching teacher/coaches is greater while the former is (a) coaching and (b) not coaching.</td>
<td>Fail to reject</td>
</tr>
<tr>
<td>4.  $H_0$: There is no significant difference in the favorableness of the leadership situation for teacher/coaches while coaching as compared to when not coaching. $H_1$: There is a significant difference in the favorableness of the leadership situation for teacher/coaches while coaching as compared to when not coaching.</td>
<td>Fail to reject</td>
</tr>
<tr>
<td>5.  $H_0$: There is no significant relationship between situational favorableness and the classroom teaching behavior of teacher/coaches (a) coaching and (b) not coaching. $H_1$: There is a significant relationship between situational favorableness and the classroom teaching behavior of teacher/coaches when (a) coaching and (b) not coaching.</td>
<td>Fail to reject</td>
</tr>
<tr>
<td>6.  $H_0$: The time devoted to teaching related activities is not significantly related to the classroom teaching behavior of teachers in this study. $H_1$: The time devoted to teaching related activities is significantly related to the classroom teaching behavior of teachers in this study.</td>
<td>Fail to reject</td>
</tr>
<tr>
<td>7.  $H_0$: There is no significant difference in the time devoted to teaching related activities by teacher/coaches than that devoted by non-coaching teacher/coaches. $H_1$: The time devoted to teaching related activities by teacher/coaches is less than that devoted by non-coaching teacher/coaches.</td>
<td>Fail to reject</td>
</tr>
<tr>
<td>8.  $H_0$: There is no significant difference in the time devoted to teaching related activities by teacher/coaches when coaching as compared to when not coaching. $H_1$: The time devoted to teaching related activities by teacher/coaches is less while coaching than when not coaching.</td>
<td>Fail to reject</td>
</tr>
<tr>
<td>9.  $H_0$: The time devoted to coaching activities is not significantly related to the classroom teaching behavior of teacher/coaches. $H_1$: The time devoted to coaching activities is significantly related to the classroom teaching behavior of teacher/coaches.</td>
<td>Reject</td>
</tr>
</tbody>
</table>
Conclusions

The following general conclusions appeared warranted on the basis of the results, and the evidence outlined in Table 8 above.

1. There is a reduction in the variety and quality of classroom communication management skills employed by track and field teacher/coaches while concurrently involved in a coaching role. Participation in coaching has a slight counterproductive effect on classroom teaching behavior, although the effect may be valid only for task-oriented (intermediate-LPC) teacher/coaches.

2. The coaching responsibilities of track and field teacher/coaches do not infringe upon their teaching responsibilities; these individuals do not increase their commitment to the coaching role at the expense of their commitment to the teaching role. Coaching thus represents a time demand over and above that of teaching.

3. The leadership situations confronting track and field teacher/coaches while coaching are neither more advantageous nor disadvantageous for effective group leadership than when they are not coaching. In particular, teacher-student relations, while not aggravated, are not enhanced while the teacher/coach is coaching.

Recommendations

The following recommendations which arise from the results of this thesis address either prospects for future
research or implications for the Ontario Ministry of Education.

Future Research

With respect to teacher effectiveness research, this study illustrates the potential of the 'contingency' model as a research paradigm. Teacher effectiveness research would seem to have remained at the point in its development of seeking isolated causal factors to account for classroom effects. Leadership theorists, on the other hand, now recognize that there is no single factor upon which effectiveness is contingent, but rather acknowledge interrelationships among leadership and situational variables as they affect both leader behavior and group performance. The application of Fiedler's 'contingency' model may provide valuable insight into the measurement and/or evaluation of teacher effectiveness. Under the hypothesis of the 'contingency' model, in highly favorable or unfavorable classroom situations teacher task relevant behavior would be most suited for effective group leadership. In the intermediately favorable classroom situation teacher group considerate (relationship-oriented) behavior would be most appropriate. The preparation of teachers with the capacity to recognize, and to adjust behavior to suit the demands of the teaching situation is suggested. From this potential it follows that validations of the 'contingency' model in the edu-
cational setting are required.

From a general educational perspective, a number of noteworthy relationships were implied in the discussion, particularly that of the causal model. Given that the appropriateness of the 'contingency' model in the educational milieu can be firmly established, some of the relationships warranting examination include:

1. Leadership style as a function of teaching/coaching experience;
2. Leadership style and its impact on teacher/coach-student relationships;
3. The relationships among role and/or activity structure, student expectations, and teacher/coach-student relations;
4. Teaching behavior as a curvilinear function of leadership style.

A number of future research problems related to the teaching/coaching interface would seem to be suggested. Of these, some of the more prominent questions include:

1. What is the classroom teaching behavior of teacher/coaches like in comparison to that of non-coaching teachers both while coaching and when not coaching?
2. Are the effects of coaching demands on classroom teaching behavior equivalent for all interschool sports, or for a variety of other cocurricular activities?
3. Are men and women teacher/coaches affected equally
in the classroom by coaching?

4. Are the hours spent by teacher/coaches in a coaching role comparable for most interschool sports? If so, and if the magnitudes of the effect of coaching on teaching vary according to the sport, is the effect then of a psycho-sociological nature?

5. What types of teachers/leaders are best suited to assume the dual role responsibility of teacher/coaches?

6. To what extent is coaching experience a modulating factor insofar as the effect of coaching on classroom teaching behavior is concerned?

In recognition of the precursory nature of the study a replication with the following considerations is recommended:

1. An increased variable base, e.g. age or professional preparation of teacher/coaches;

2. An increased subject base, including women teacher/coaches, experienced teacher/coaches, and both high- and low-LPC teacher/coaches;

3. Minimization of seasonal effects on teaching behavior, possibly through a time series design;

4. Investigation of curvilinear relationships (diminishing returns) in the case of coaching hours and the effect on teaching.

Ministry of Education

Confirming a link with its origin, the results of
this study should provide the Ontario Ministry of Education with food for thought. The following recommendations are directed at that institution:

1. A monitoring system of teacher/coaches geared toward the detection of a counterproductive effect of coaching on classroom teaching;

2. Special attention be given to inexperienced teacher/coaches who must, in addition to the coaching role, make initial adjustments to the teaching role;

3. Adjustments of either coaching or teaching workloads until optimum levels of each are determined by future research;

4. Adoption of a preventative outlook by amending measures in teacher preparation programs to improve the preparation of teaching interns for the responsibility of managing both teaching and coaching functions.
APPENDIX A
INTERN EVALUATION
CHECKLIST ©

Name........................................School.....................Date.................
Subject(s)............................Gender{(Levels)..............Observer...............

I. SKILLS PRACTICED BY PUPILS DURING OBSERVATION

<table>
<thead>
<tr>
<th>Listening</th>
<th>Vocabulary Building</th>
<th>Explaining</th>
<th>Evaluating</th>
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</thead>
<tbody>
<tr>
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<td>Reading</td>
<td>Investigating</td>
<td>Inventing</td>
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<tr>
<td>Remembering</td>
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<td>Constructing</td>
<td>Data Collecting</td>
<td>Reporting</td>
<td>Performing</td>
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<tr>
<td>Empathizing</td>
<td>Collaborating</td>
<td>Confronting</td>
<td>Consulting</td>
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</table>

TOTAL __________

II. SKILLS DEMONSTRATED BY INTERN DURING OBSERVATION

A. INTERACTING

1. Arouses Pupil Interest
2. Encourages Pupil Questioning
3. Encourages Pupil Originality
4. Encourages Pupil Self-Evaluation
5. Encourages Pupil to Set Own Objectives
6. Encourages Positive Pupil-Pupil Interactions
7. Discourages Pupil Disengagement from Activities

B. OBSERVING

8. Uses Pupils' Points of View
9. Meets Affective Needs of Pupils
10. Recognizes and Uses Teachable Moment
11. Recognizes and Uses Pupils' Proficiency Levels
12. Uses Continuity of Learning
13. Uses Transferability of Learning

C. QUESTIONING & PLANNING

<table>
<thead>
<tr>
<th>14. INFORMATION Level Questions</th>
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<tr>
<td>15. APPLICATION Level Questions</td>
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<td>16. THINKING Level Questions</td>
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<td>18. Sequencing of Questions</td>
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<tr>
<td>19. Anticipatory Planning</td>
</tr>
<tr>
<td>20. Sets Clear Activity Objectives</td>
</tr>
<tr>
<td>21. Sets Clear Quality Objectives</td>
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</table>

D. CLASSROOM JUDGMENT

22. Appropriates Pace
23. Appropriate Changes of Pace
24. Accomodates Different Work Speeds
25. Manages Materials Effectively
26. Recovery Effectively from Interruptions
27. Keeps Records Effectively
28. Uses Own Time Effectively
29. Uses Pupils' Time Effectively

SCORE (0 - U) __________

TOTALS __________

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APPENDIX B

LEAST PREFERRED COWORKER SCALE

Now, think of the person with whom you can work least. He may be someone you work with now, or he may be someone you knew in the past. He does not have to be the person you like least well, but should be the person with whom you had the most difficulty in getting a job done. Describe this person as he appears to you.

Pleasant  *****************  Unpleasant
Friendly  *****************  Unfriendly
Rejecting  *****************  Accepting
Helpful  *****************  Frustrating
Unenthusiastic  *****************  Enthusiastic
Tense  *****************  Relaxed
Distant  *****************  Close
Cold  *****************  Warm
Cooperative  *****************  Uncooperative
Supportive  *****************  Hostile
Boring  *****************  Interesting
Quarrelsome  *****************  Harmonious
Self-Assured  *****************  Hesitant
Efficient  *****************  Inefficient
Gloomy  *****************  Cheerful
Open  *****************  Guarded

APPENDIX C

GROUP ATMOSPHERE SCALE

Describe the atmosphere of your group by checking the following items.

1. Friendly 8 7 6 5 4 3 2 1 Unfriendly
2. Accepting Rejecting
3. Satisfying Frustrating
4. Enthusiastic Unenthusiastic
5. Productive Nonproductive
6. Warm Cold
7. Cooperative Uncooperative
8. Supportive Hostile
9. Interesting Boring
10. Successful Unsuccessful

From A Theory of Leadership Effectiveness by Fred E. Fiedler
APPENDIX D

POSITION POWER CHECKLIST

1. Compliments from the leader are appreciated more than compliments from other group members.
2. Compliments are highly valued, criticisms are considered damaging.
3. Leader can recommend punishments and rewards.
4. Leader can punish or reward members on his own accord.
5. Leader can effect (or can recommend) promotion or demotion.
6. Leader chairs or coordinates group but may or may not have other advantages, i.e., is appointed or acknowledged chairman or leader.
7. Leader's opinion is accorded considerable respect and attention.
8. Leader's special knowledge or information (and members' lack of it) permits leader to decide how task is to be done or how group is to proceed.
9. Leader cues members or instructs them on what to do.
10. Leader tells or directs members what to do or what to say.
11. Leader is expected to motivate group.
12. Leader is expected to suggest and evaluate the members' work.
13. Leader has superior or special knowledge about the job, or has special instructions but requires members to do job.
14. Leader can supervise each member's job and evaluate it or correct it.
15. Leader knows his own as well as members' job and could finish the work himself if necessary, e.g., writing a report for which all information is available.
16. Leader enjoys special or official rank and status in real life which sets him apart from or above group members, e.g., military rank or elected office in a company or organization. (+5 points)
17. Leader is given special or official rank by experimenter to simulate for role-playing purposes, e.g., "you are a general" or "the manager". This simulated rank must be clearly superior to members' rank and must not be just that of "chairman", or "group leader" of the group during its work period. (+3 points)
18. Leader's position is dependent on members; members can replace or depose leader. (-5 points)

APPENDIX E
MISCELLANEOUS INFORMATION FORM

Teacher/Coach Study

1. Name ____________________________ M  F  GROUP  OBSERVE
2. Subject taught ____________________________
3. Grade taught ________________
4. Group task ____________________________
5. Teaching experience (in years) __________
6. Coaching experience (in years) __________
7. Time spent on teaching (in hours/week):
   A. preparation _______________________
   B. marking and evaluation ____________
   C. counseling-type activities ___________
   D. classroom teaching _______________
   E. total score _______________
8. Time spent on coaching (in hours/week):
   A. coaching during practices ___________
   B. additional related activities __________
   C. total score _______________
APPENDIX F
THE RESEARCH DATA

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<td>Weekly hours on teaching related activities (2 decimal places)</td>
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APPENDIX G

CLASSIFICATION OF OVERALL MEANS
FOR THE CONTINGENCY MODEL

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<td>GAS</td>
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<td>Position power</td>
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APPENDIX H

CHI SQUARE GROUPS INDEPENDENT
MACRO-ANALYSIS

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*P=.05
### APPENDIX I

#### T-TESTS FOR TEACHING EXPERIENCE

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<td>.67</td>
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<td>B₂C₂</td>
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*P = .05
**APPENDIX J**

**T-TESTS FOR LPC**

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<th>Groups</th>
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*P = .05
## APPENDIX K

**MULTIPLE REGRESSION CORRELATION COEFFICIENTS**

**MACRO-ANALYSIS**

<table>
<thead>
<tr>
<th>Variables</th>
<th>Teaching experience</th>
<th>Hours teaching</th>
<th>LPC</th>
<th>GAS</th>
<th>IEC</th>
<th>Task Structure</th>
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## APPENDIX L

**CHI SQUARE IEC DEPENDENT MACRO-ANALYSIS**

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*P = .05
### APPENDIX M

**MULTIPLE REGRESSION CORRELATION COEFFICIENTS MICRO-ANALYSIS**

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<th>IEC</th>
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## APPENDIX N

**CHI SQUARE IEC DEPENDENT MICRO-ANALYSIS**

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*P = .05
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           1977

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                     Teaching Assistantship 1976

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                     School Class and Age Class
                     Swimming, funded by the Canada
                     Council and the Canadian National
                     Center for Sport and Recreation.
                     Group facilitator, Special Workshops
                     SIR/CAR study of the Role of Inter-
                     school Sports in the Secondary
                     Schools of Ontario-Focus on SWOSSA
                     of OFSAA, funded by the Ontario
                     Ministry of Education.